

Syllabus
for
B.Sc.(M.P.Cs) – R17



VIKRAMA SIMHAPURI UNIVERSITY: NELLORE

Course Structure BSC(MATHEMATICS,PHYSICS, COMPUTER SCIENCE)

w.e.f.2017-2018
Semester -I

Sl. No.	Course	Name of the subject	Total Marks	Mid. Sem. Exam*	Sem. End Exam	Teaching Hours**	Credits
1.	First Language	English	100	25	75	4	3
2.	Second Language	(Tel/Hindi/Urdu/Sans)	100	25	75	4	3
3.	Foundation Course -1	HVPE (Human Values & Professional Ethics)*	50	---	50	2	2
4.	Foundation Course- 2	Environmental Studies	50	---	50	2	2
5.	Mathematics-I	Differential Equations Problem Solving Sessions	100	25	75	6	5
6.	Physics-I	Mechanics& Properties of Matter	100	25	75	4	4
		Practical	50	0	50	2	1
7.	Computer Science-I	Computer Fundamentals & Photoshop	100	25	75	4	3
		Practical	50		50	2	2
Total			700	125	575	30	25



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Course Structure BSC(MATHEMATICS,PHYSICS, COMPUTER SCIENCE)

w.e.f.2017-2018

Semester –II

BSC(MSCS) Semester –I

Sl. No.	Course	Name of the subject	Total Marks	Mid. Sem. Exam	Sem. End Exam	Teaching Hours**	Credits
1.	First Language	English	100	25	75	4	3
2.	Second Language	(Tel/Hindi/Urdu/Sans)	100	25	75	4	3
3.	Foundation Course -3	ICT-1 (Information & communication Technology)	50	---	50	2	2
4.	Foundation Course-4	Communication & Soft Skills-1	50	---	50	2	2
5.	Mathematics-II	Solid Geometry Problem Solving Sessions	100	25	75	6	5
6.	Physics-II	Waves & Oscillations	100	25	75	4	4
		Practical	50	0	50	2	1
7.	Computer Science-II	Programming in C	100	25	75	4	3
		Practical	50		50	2	2
Total			700	125	575	30	25



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BSC(MATHEMATICS,PHYSICS, COMPUTER SCIENCE)

w.e.f.2017-2018

Semester –III

Sl. No.	Course	Name of the subject	Total Marks	Mid. Sem. Exam	Sem. End Exam	Teaching Hours**	Credits
1.	First Language	English	100	25	75	4	3
2.	Second Language	(Tel/Hindi/Urdu/Sans)	100	25	75	4	3
3.	Foundation Course- 5	ICT-2 (Information & communication Technology)	50	---	50	2	2
4.	Foundation Course- 6	Communication & Soft Skills-2	50	---	50	2	2
5.	Mathematics-III	Abstract Algebra Problem Solving Sessions	100	25	75	6	5
6.	Physics-III	Wave Optics	100	25	75	3	3
		Practical	50		50	2	2
7.	Computer Science-II	Object oriented programming using java	100	25	75	4	3
		Practicals	50		50	2	2
Total			700	125	575	27	25



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BSC(MATHEMATICS,PHYSICS, COMPUTER SCIENCE)

w.e.f.2017-2018

Semester –IV

Sl. No.	Course	Name of the subject	Total Marks	Mid. Sem. Exam	Sem. End Exam	Teaching Hours**	Credits
1.	Foundation Course- 7	Communication & Soft Skills-3	50	---	50	2	2
2.	Foundation Course- 8	Analytical Skills*	50	---	50	2	2
3.	Foundation Course- 9	Entrepreneurship	50	---	50	2	2
4.	Foundation Course- 10	Leadership Education**	50	---	50	2	2
5.	Mathematics-IV	Real Analysis Problem Solving Sessions	100	25	75	6	5
6.	Physics-IV	Thermodynamics & Radiation Physics	100	25	75	3	3
		practical	50	0	50	2	2
7.	Computer Science-IV	Data structures	100	25	75	4	3
		Data structures using Java lab	50		50	2	2
Total			600	75	525	25	23



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Semester –V

S.no	Course	Name of the subject	Total marks	Mid Sem Marks	Sem End Exam	Teaching Hours	Credits
1.	Mathematics	Ring Theory & Matrices Problem Solving Sessions	100	25	75	5	5
2.		Linear Algebra Problem Solving Sessions	100	25	75	5	5
3.	Physics	Electricity, Magnetism & Electronics	100	25	75	4	4
		Practical	50	0	50	2	1
4.		Modern Physics	100	25	75	4	4
		Practical	50	0	50	2	1
5.	Computer Science	DBMS	100	25	75	3	3
		DBMS Lab	50	0	50	2	2
6.		Software Engineering	100	25	75	3	3
		Software Engineering Lab	50	0	50	2	2
		Total	800	150	650	30	30



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Semester –VI

S.no	Semester	paper	Name of the subject	Total marks	Mid Sem Marks	Sem End Exam	Teaching Hours	Credits		
1.	VI	Mathematics VII	Electives: (any one)							
			VII-(A) Vector Calculus	100	25	75	5	5		
			VII-(B) Operations Research							
			VII-(C) Number Theory Problem solving sessions							
2.		Mathematics VIII	Cluster Electives:							
			VIII-A-1: Laplace Transforms	100	25	75	5	5		
			VIII-A-2: Integral Transforms	100	25	75	5	5		
			VIII-A-3: <i>Project work</i>	100	0	100	5	5		
			OR							
			VIII-B-1: Principles of Mechanics	100	25	75	5	5		
			VIII-B-2: Fluid Mechanics	100	25	75	5	5		
			VIII-B-3: <i>Project work</i>	100	0	100	5	5		
			OR							
			VIII-C-1: Graph Theory	100	25	75	5	5		
			VIII-C-2: Applied Graph	100	25	75	5	5		
			VIII-C-3: <i>Project work</i>	100	0	100	5	5		
OR										
VIII-D-1: Numerical Analysis	100	25	75	5	5					
VIII-D-2: Advanced Numerical Analysis	100	25	75	5	5					
VIII-D-3: <i>Project work</i>	100	0	100	5	5					
3.	VI	Physics VII	Choose any one of the following Electives A or B or C							
			Paper VII-(A): Analog and Digital Electronics	100	25	75	3	3		
			Practical	50	0	50	2	2		
			OR							
			Paper VII-(B): Materials Science	100	25	75	3	3		
			Practical	50	0	50	2	2		
			OR							
Paper VII-(C): Renewable Energy	100	25	75	3	3					
Practical	50	0	50	2	2					

4.	Physics VIII	CLUSTER A					
		Paper VIII-A-1. Introduction to Microprocessors and Microcontrollers	100	25	75	3	3
		Practical	50	0	50	2	2
		Paper VIII-A-2. Computational Physics and Programming	100	25	75	3	3
		Practical	50	0	50	2	2
		Paper VIII-A-3. Electronic Instrumentation	100	25	75	3	3
		Practical	50	0	50	2	2
		CLUSTER B					
		Paper VIII-B-1. Fundamentals of Nano science	100	25	75	3	3
		Practical	50	0	50	2	2
		Paper VIII-B-2. Synthesis and Characterization of Nano materials	100	25	75	3	3
		Practical	50	0	50	2	2
		Paper VIII-B-3. Applications of Nano materials and Devices	100	25	75	3	3
		Practical	50	0	50	2	2
		CLUSTER C					
		Paper VIII-C-1. Solar Thermal and Photovoltaic Aspects	100	25	75	3	3
		Practical	50	0	50	2	2
		Paper VIII-C-2. Wind, Hydro and Ocean Energies	100	25	75	3	3
		Practical	50	0	50	2	2
		Paper VIII-C-3. Energy Storage Devices	100	25	75	3	3
		Practical	50	0	50	2	2
5.	COMPUTER SCIENCE VII	Elective -I					
		A. Operating systems	100	25	75	3	3
		B. Distributed Systems					
		C. Web Technologies					
Lab for Elective -I(A OR B OR C)	50	0	50	2	2		
6.	COMPUTER SCIENCE VIII Cluster-A 1,2,3 or Cluster-B 1,2,3 or Cluster-c 1,2,3	Elective -II (CLUSTER -A)					
		1. Visual Basic programming	100	25	75	3	3
		Visual Basic programming Lab	50	0	50	2	2
		2. PHP(Personal Home page)	100	25	75	3	3
		PHP Lab	50	0	50	2	2
		3. Project work	150	50	100	5	5
		Elective -II (CLUSTER -B)					
		1. Foundation of Data Science	100	25	75	3	3
		Data Science Lab	50	0	50	2	2
		2. Big Data Technology	100	25	75	3	3
Big Data Technology Lab	50	0	50	2	2		
3. Project work	150	50	100	5	5		
TOTAL (MATHEMATICS CLUSTER)		700	125	575	30	30	
TOTAL (PHYSICS CLUSTER)		850	175	675	30	30	
TOTAL (COMPUTER SCIENCE CLUSTER)		850	175	675	30	30	

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE
General English Syllabus for B.A/ B.A. (OL)/B.Com/B.Sc/BBA/BCA Courses under
CBCS w.e.f. 2015-16 (Revised in April-2016)

SEMESTER – I

1. Every unit shall state the objectives and expected deliverables.
2. Every lesson shall have
 - i) Questions on subject comprehension, paragraph, short note, single sentence answer types
 - ii) Exercises on vocabulary, syntax, and pronunciation
 - iii) Language exercises shall include exercises in paraphrasing, note-making and report writing wherever possible
 - iv) Pre -reading and post- reading activities.

Unit – I

PROSE

1. A.P. J. Abdul Kalam: The Knowledge Society (from *Ignited Minds*)
2. NgugiWaThiong'o: The Language of African Literature (from *Decolonizing the Mind*)

Unit – II

POETRY

1. Robert Frost: The Road Not Taken
2. Nissim Ezekiel: Night of the Scorpion

Unit – III

SHORT STORY

1. Mulk Raj Anand : The Lost Child
2. Henry Lawson: The Loaded Dog

Unit – IV

ONE - ACT PLAY

William Shakespeare: The Merchant of Venice (Court Scene – Act IV Scene -1)

Unit – V

LANGUAGE ACTIVITY

1. Classroom and Laboratory Activities
 - i. Single Sentence Answer Questions on Vocabulary (spelling), sound(pronunciation), sense (meaning), and syntax (usage)
2. Classroom Activity
 - i. Exercises in Articles and Prepositions
 - ii. Exercises in Tenses, Interrogatives and Question tags

Note: In classroom instruction it may be ensured that the theoretical and practical components of CSS-I complement the language activity in this semester.

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VIKRAMA SIMHAPURI UNIVERSITY :: KAKUTUR

General English

(Common to FIRST YEAR – FIRST SEMESTER B.A., B.A. (OL), B.Com., B.Sc., BBA, BCA)
(A. P. Common Core Syllabus (CBCS) for I year Effective from 2015-16) (Revised in April, 2016)

Model Question Paper (2017-18)

Time: 3 Hours

Max. Marks: 75

1. Answer any TWO of the following questions. 2x5 = 10
 - a. What are the problems India would face in making Abdul Kalam's dream into a reality?
 - b. Describe the author's experiences about language and literature in "The Language of African Literature".
 - c. Describe how changes in society through technology can lead to wealth generation in a country like India according to Kalam.
2. Answer any TWO of the following questions. 2x5 = 10
 - a. 'And that has made all the difference.' Explain it with reference to the poem 'The Road Not Taken'.
 - b. Narrate all the activities presented in the poem 'Night of the Scorpion'.
 - c. Pick out the comparisons in the poem 'Night of the Scorpion' and explain how they enhance the beauty of the poem.
3. Answer any TWO of the following questions. 2x5 = 10
 - a. Describe the different feelings of the child in the story 'The Lost Child'.
 - b. Bring out the humorous elements described in 'The Loaded Dog'.
 - c. Do you think that all parents behave the same way as the child's parents in the story 'The Lost Child'? Discuss.
4. Answer any ONE of the following questions. 1x5 = 5
 - a. Describe the role of Portia in deciding the case of Antonio in the court of justice.
 - b. How does Portia turn the tables on Shylock?
5. Read the following passage and answer the questions that follow. (From Prose) 5x1 = 5
Knowledge has many forms and it is available at many places. It is acquired through education, information, intelligence and experience. It is available in academic institutions with teachers, in libraries, in research papers, seminar proceedings and in various organizations and workplaces with workers, managers, in drawings, in process sheets and on the shop floors. Knowledge, though closely linked to education, comes equally from learning skills such as those possessed by our artists, craftsmen, hakims, vaidyas, philosophers and saints, as also our housewives. Knowledge plays a very important role in their performance and output too. Our heritage and history, the rituals, epics and traditions that form part of our consciousness are also vast resources of knowledge as are our libraries and universities. There is an abundance of unorthodox, earthy wisdom in our villages.
 - a. How is knowledge acquired?
 - b. Where is knowledge available?
 - c. In whose performance and output does knowledge play a very important role?
 - d. Where is an abundance of wisdom?
 - e. What is the antonym of 'unorthodox'?
6. Identify the Correct spelling in each group. 5x1 = 5
 - a. i. Hight ii. Height iii. Hieght
 - b. i. Aavailable ii. Available iii. Avialable
 - c. i. Incomplete ii. Incomplete iii. Incomplet
 - d. i. Acheivement ii. Achievment iii. Achievement
 - e. i. Campain ii. Campaign iii. Campain
7. Write the English spelling of the words given in phonemic transcription. 5x1 = 5
 - a. /fɑ:st/ b. / meIk/ c. /mandei/ d. /zu:/ e. / mæn
8. Fill in the blanks with suitable Articles. 5x1 = 5
 - a. The Nile is ___ longest river.
 - b. My friend came late by ___ hour.
 - c. Honesty is ___ best policy.
 - d. I saw ___ one-eyed man.
 - e. My friend is ___ honest man.

9. Fill in the blanks with suitable Prepositions.

5x1 = 5

- a. I prefer milk ___ coffee.
- b. He has been staying here ____ 2 pm.
- c. My brother is suffering _____ fever.
- d. There is an exception _____ every rule.
- e. He is senior _____ me.

10. Fill in the blanks with the correct forms of the verbs given in brackets.

5x1 = 5

- a. I _____ (buy) a house last year.
- b. She _____ (read) a book at 2 pm yesterday.
- c. It _____ (rain) for the last two hours.
- d. They _____ (work) in that office from 2010 to 2015.
- e. The thief _____ (escape) before I opened the door.

11. Convert the following sentences into questions.

5x1 = 5

- | | |
|--------------------------|-----------------------------|
| a. They are students. | b. She is writing a letter. |
| c. You know him. | d. It is a book. |
| e. He met her last week. | |

12. Add a question tag to each of the following sentences.

5x1 = 5

- | | |
|-----------------------|-----------------------------|
| a. I am a student. | b. He doesn't drink liquor. |
| c. They won't come. | d. The film is not good. |
| e. You are impatient. | |

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VIKRAMA SIMHAPURI UNIVERSITY::NELLORE

Part I (B) SANSKRIT

CBCS SEMESTER WISE SYLLABUS

COMMON TO B.A./B.SC./B.Com./BBA

I SEMESTER

PAPER – I POETRY, PROSE AND GRAMMAR - I

Unit – I	Old poetry	1. ABHIJNAANAM Ramayanam – Kishkindhaa Kaanda – 6 th Canto 1- 27 Slokas 2. AATITHYAM Bhaagavatam – IX Skandha - 21 st Adhyaaya – 1 – 36 Slokas
Unit – II	Modern Poetry	1. UNNATIHI From Bharatee Bhushanam by Dr D.N.Deekshit –Pp No. 66 – 68 2. VIVIKTA PUSHPA KARANDAHA By Dr Rani Sadasiva Murthy, Selected Stanzas – 14
UNIT – III	PROSE	MOORKHATAA PAREEKSHITAKAARAKAM OF PANCHARANTRAM – 3 rd & 4 th Stories- Murkha Brahmana Katha & Murkha Pandita Katha – Page 734 – 743 , Pub. Krishnadas Academy, Varanasi
UNIT IV	GRAMMAR	1. DECLENSIONS Nouns ending in vowels, Deva, Kavi, Bhanu, Dhatru, Pitru, Go, Ramaa, Mati 2. CONJUGATIONS 1 st Conjugation – Bhoo, Gam, Shtha, Drusir, Labh, Mud 2 nd Conjugation – AS 10 th Conjugation – Bhaash
UNIT – V	GRAMMAR -	1. SANDHI Swara Sandhi : Sarvarnadeergha, Ayovayava, Guna, Vruddhi, Yana desa. Halsandhi : Scutva, Stutva, Anunasika 2. SAMASA – Dwandwa, Tatpurusha, Karmadharaya, Dwigu.

VIKRAMA SIMHAPURI UNIVERSITY
NELLORE - 524 001
SANSKRIT

CBCS SEMESTER WISE SYLLABUS

PATRON OF THE QUESTION PAPER

SEMESTER-I

Time : 3hrs

Max Marks : 75

I.	Essay One from each lesson - Abhignanam and Antharyam	1 out of 2	1 x 10	10M
II.	Essay One from each Lesson : Unnati and Viviktapushpa Karandah.	1 out of 2	1 x 8	08M
III.	Essay One from each Lesson : Murkhabrahmana Katha and Murkha Pandita Katha	1 out of 2	1 x 10	10M
IV.	Short Answers Three from, Abhignanam and Athityam Two from Murkha Brahmana Katha	4 out of 8	4 x 2	08M
V.	Annotations Two from each lesson Abhignanam, Athidhyam, Murkhabrahmana Katha, Murkha Pandita Katha	4 out of 8	4 x 3	12 M
VI.	Full form of Sabda Three from Pullinga and one from Srilinga	2 out of 4	2 x 4	08M
VII.	Full form of a Lakara of a given Dhatu Two from each Parshmaipada and Athmanepada		2 out of 4	2x3 = 6
VIII.	Combine any SIX and mention the name of the sandhi	6 out of 10		6x1=6
IX.	Simple Writing of Vigrahavakya One from Each Samasa		3 out of 6	3x1=3
X.	Filling the Sloka and Writing the Meaning Two from Abhignanam and two from Adityam		2 out of 4	2x2=4

Note : Question Paper should be Sanskrit Only. English Translation should not be there.

Foundation Course - 1
I. HUMAN VALUES AND PROFESSIONAL ETHICS
Common for BA/BCom/BSc/BBA/BCA Programmes
I Semester (Total 30 Hrs)

Unit-I : Introduction to Value Education

1. Value Education, Definition, Concept and Need for Value Education
2. The Content and Process of Value Education
3. Self-Exploration as a means of Value Education
4. Happiness and Prosperity as parts of Value Education

Unit-II : Harmony in the Human Being

1. Human Being is more than just the Body
2. Harmony of the Self ('I') with the Body
3. Understanding Myself as Co-existence of the Self and the Body
4. Understanding Needs of the Self and the Needs of the Body

Unit-III : Harmony in the Family and Society and Harmony in the Nature

1. Family as a basic unit of Human Interaction and Values in Relationships
2. The Basics for respect and today's Crisis : Affection, Care, Guidance, Reverence, Glory, Gratitude and Love
3. Comprehensive Human Goal : The Five dimensions of Human Endeavour

Unit-IV : Social Ethics

1. The Basics for Ethical Human conduct
2. Defects in Ethical Human Conduct
3. Holistic Alternative and Universal order
4. Universal Human Order and Ethical Conduct

Unit-V : Professional Ethics

1. Value Based Life and Profession
2. Professional Ethics and Right Understanding
3. Competence in Professional Ethics
4. Issues in Professional Ethics - The Current scenario
5. Vision for Holistic Technologies, Production System and Management Models

Reference Books :

1. A.N.Tripathy, Human Values, New Age International Publishers, 2003
2. Bajpai.B.L., Indian Ethos and Modern Management, New Royal Book Co., Lucknow, Reprinted, 2004
3. Bertrand Russell, Human Society in Ethics and Politics
4. Corliss Lamont, Philosophy of Humanism
5. Gaur.R.R., Sangal.R, Bagaria.G.P., A Foundation Course in Value Education, Excel Books, 2009
6. Gaur.R.R., Sangal.R, Bagaria.G.P., Teacher's Manual, Excel Books, 2009
7. I.C.Sharma, Ethical Philosophy of India, Nagin & Co., Julundhar
8. Mortimer.J.Adler, What Man has Made of Man
9. R.Subramanian, Professional Ethics, Oxford University Press
10. Text Book for Intermediate Ethics and Human Values, Board of Intermediate Education & Telugu Academy, Hyderabad
11. William Lilly, Introduction to Ethics, Allied Publishers

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE
THREE YEAR DEGREE EXAMINATION
FIRST YEAR EXAMINATION
SEMESTER-I
HUMAN VALUES AND PROFESSIONAL ETHICS
Common for BA/BCom/BSc/BBA/BCA Programmes
MODEL PAPER

TIME: 2 Hrs

Max Marks: 50

Answer any FIVE of the following questions 5 X 10 =50

1. నేటి వృత్తిపరమైన విద్యావ్యవస్థలో విలువల విద్య అవశ్యకత ఎట్టిది?
What is the need for value education in the present day professional oriented education?
2. స్వీయ పరిశోధన అనగానేమి? అది ఎలా సాధ్యం?
What is meant by self-exploration? How it can be achieved?
3. నేను, శరీరం యొక్క కార్యకలాపాలను ఎలా అర్థం చేసుకుంటావు?
What do you mean by understanding the activities of the self and body?
4. “సంయమ” “స్వస్థ్య” అనగా నేమి? అవి ఒకదానికొకటి ఎట్టి సంబంధం కల్గియున్నాయి?
Define sanyama and svasthya and explain how they are related?
5. మానవ సంబంధాలను అర్థం చేసుకోవటానికి కుటుంబం ఒక ప్రయోగశాల?
వివరింపుము?
“Family is a natural laboratory to understand human relationship” – Explain.
6. సంపూర్ణమైన మానవ లక్ష్యానికి అవసరమైన ప్రణాళిక ఎట్టిది?
What is the programme needed to achieve the comprehensive human goal?
7. సరైన అవగాహన నీతివంతమైన జీవనానికి ఎలా దోహదం చేస్తుంది?
How does right understanding provide the basis for ethical human conduct?
8. సంపూర్ణ ప్రత్యామ్నాయ పయనంలోని వివిధ దశలను పేర్కొనుము?
What are the various stages of journey towards the destination of holistic alternatives?
9. నేడు వృత్తిధర్మములో నెలకొన్న సమస్యలను విశ్లేషించి వాని పరిష్కారమార్గములను సూచింపుము?
Critically examine the issues in professional ethics?
10. సంపూర్ణ ప్రత్యామ్నాయం లేక సంపూర్ణ మానవ లక్ష్యాన్ని సాధించటంలో సాంకేతిక, ఉత్పాదన, యాజమాన్యాల పాత్రను వివరించండి?
What is the vision for holistic alternative? Mention the broad holistic criteria for evaluation of technologies production systems and management models?

Instruction to Paper Setter :

Two questions must be given from each unit.

Foundation Course – 2
ENVIRONMENTAL STUDIES
Common for BA/BCom/BSc/BBA/BCA Programmes
Semester – I (Total 30 Hours)

Unit-I : Natural Resources:

6 Hrs

Definition, scope and importance. Need for public awareness.

Brief description of;

■ Forest resources: Use and over-exploitation. Deforestation; timber extraction, mining, dams. Effect of deforestation environment and tribal people

■ Water resources: Use and over-utilization. Effects of over utilisation of surface and ground water. Floods, drought.

■ Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.

■ Food resources: World food problems, Effects of modern agriculture; fertilizer-pesticide, salinity problems.

■ Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.

■ Land resources: Land as resources, land degradation, man induced landslides, soil erosion and desertification

Unit-II : Ecosystems, Biodiversity and its conservation

6 Hrs

| Concept of an ecosystem

| Structure and function of an ecosystem

| Producers, consumers and decomposers

■ Food chains, food webs and ecological pyramids

■ Characteristic features of the following ecosystems:-
Forest ecosystem, Desert ecosystem, Aquatic ecosystem.

■ Value of biodiversity: Consumptive use, productive use. Biodiversity in India.

| Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts.

| Endangered and endemic species of India

| Conservation of biodiversity

Unit-III : Environmental Pollution

6 Hrs

■ Definition

■ Causes, effects and control measures of :-

a. Air pollution

b. Water pollution

c. Soil pollution

d. Noise pollution

■ Solid waste management; Measures for safe urban and industrial waste disposal

| Role of individual in prevention of pollution

| Disaster management: Drought, floods and cyclones

Unit-IV : Social Issues and the Environment

6 Hrs

■ From Unsustainable to Sustainable development

■ Water conservation, rain water harvesting, watershed management.

■ Climate change, global warming, ozone layer depletion,

■ Environment protection Act

■ Wildlife Protection Act, Forest Conservation Act

Unit-V : Human Population and the Environment

6 Hrs

- Population explosion, impact on environment.
- Family welfare Programme
- Environment and human health
- Role of Information Technology in Environment and humanhealth.

Reference Books :

1. Environmental Studies by Dr.M.Satyanarayana, Dr.M.V.R.K.Narasimhacharyulu, Dr.G. Rambabu and Dr.V.VivekaVardhani, Published by Telugu Academy, Hyderabad.
2. Environmental Studies by R.C.Sharma, Gurbir Sangha, published by Kalyani Publishers.
3. Environmental Studies by Purnima Smarath, published by Kalyani Publishers.

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.

FIRST YEAR : SEMESTER - I

SUBJECT : (FOUNDATION COURSE-2)

Common for BA/BCom/BSc/BBA/BCA Programmes

ENVIRONMENTAL STUDIES

Time : 2hours

Max marks : 50

Answer any FIVE of the following questions.

5 X 5 = 25M

1. Define Environment and Explain Multidisciplinary Nature of the environmental science?
పర్యావరణాన్ని నిర్వచించి, పర్యావరణశాస్త్రం యొక్క బహుముఖపాఠాలను వివరించండి?
2. Write about Renewable and Non-Renewable Energy Resources?
పునరుద్ధరించగల పునరుద్ధరించలేనిశక్తి వనరులను వివరించండి?
3. Explain the structure and Functions of Ecosystem?
ఆవరణవ్యవస్థ యొక్క నిర్మాణము మరియు విధులను తెల్పండి?
4. Define Biodiversity and Explain India as a mega – Biodiversity Nation?
జీవవైవిధ్యాన్ని నిర్వచించి, భారతదేశాన్ని జీవవైవిధ్య ప్రాంతంగా వివరింపుము?
5. Write about Air pollution?
గాలి కాలుష్యాన్ని వివరించండి?
6. Describe the solid waste Management Methods?
వ్యర్థఘనపదార్థాల తరలింపు విధానాలను తెల్పండి?
7. Explain the global warming and Acid rains?
గ్లోబల్ వార్మింగ్ మరియు ఆమ్లవర్షాలను వివరించండి?
8. Describe about rain water harvesting and watershed Management?
వర్షపునీరు ప్రోధి, నిలుపుదల మరియు నీటిగట్ల యాజమాన్యపద్ధతులు వివరించండి?
9. Write about women & Child welfare programme?
స్త్రీ, శిశుసంక్షేమంను వివరించండి?
10. Explain population-unemployment?
జనాభాపెరుగుదల, నిరుద్యోగులను తెల్పండి?

Instruction to Paper Setter :

Two questions must be given from each unit.

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE
w.e.f. 2015-16 (Revised in April, 2016)
B.A./B.Sc. FIRST YEAR MATHEMATICS SYLLABUS
SEMESTER -I, PAPER - 1
DIFFERENTIAL EQUATIONS

60 Hrs

UNIT – I (12 Hours), Differential Equations of first order and first degree :

Linear Differential Equations; Differential Equations Reducible to Linear Form; Exact Differential Equations; Integrating Factors Excluding Change of Variables.

UNIT – II (12 Hours), Orthogonal Trajectories.

Cartesian co-ordinates self orthogonal Family of curves. Orthogonal trajectories : polar co-ordinates.

Differential Equations of first order but not of the first degree :

Equations solvable for p ; Equations solvable for y ; Equations solvable for x ; Equations that do not contain. x (or y); Equations of the first degree in x and y – Clairaut's Equation.

UNIT – III (12 Hours), Higher order linear differential equations-I :

Solution of homogeneous linear differential equations of order n with constant coefficients; Solution of the non-homogeneous linear differential equations with constant coefficients by means of polynomial operators.

General Solution of $f(D)y=0$

General Solution of $f(D)y=Q$ when Q is a function of x .

$\frac{1}{f(D)}$ is Expressed as partial fractions.

P.I. of $f(D)y = Q$ when $Q = be^{ax}$

P.I. of $f(D)y = Q$ when Q is $b \sin ax$ or $b \cos ax$.

UNIT – IV (12 Hours), Higher order linear differential equations-II :

Solution of the non-homogeneous linear differential equations with constant coefficients.

P.I. of $f(D)y = Q$ when $Q = bx^k$

P.I. of $f(D)y = Q$ when $Q = e^{ax}$

V P.I. of $f(D)y = Q$ when $Q = xV$

P.I. of $f(D)y = Q$ when $Q = x^m V$

UNIT – V (12 Hours), Higher order linear differential equations-III :

Method of variation of parameters (without non constant coefficient equations) ; The Cauchy-Euler Equation ; Legendre's Equations.

Prescribed Text Book :

I. A text book of mathematics for BA/BSc Vol 1 by N. Krishna Murthy & others, published by S. Chand & Company, New Delhi.

Reference Books :

1. Differential Equations and Their Applications by Zafar Ahsan, published by Prentice-Hall of India Learning Pvt. Ltd. New Delhi-Second edition.

2. Ordinary and Partial Differential Equations Raisinghanian, published by S. Chand & Company, New Delhi.

3. Differential Equations with applications and programs – S. Balachandra Rao & HR Anuradha-universities press.

4. Telugu Academy Text Book for Differential Equations.

5. I-B.Sc A text Book of a Mathematics Deepthi Publications.

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on Application of Differential Equations in Real life

Instruction to Paper Setter:

Two questions must be given from each unit in Part-A and Part-B.

1. S. Chand
2. ~~Prentice Hall~~
3. U. C. Chel
4. S. Chand
5-710 de

BLUE PRINT OF QUESTION PAPER
(INSTRUCTIONS TO PAPER SETTER)
B.A./B.Sc. MATHEMATICS SEMESTER-I
(DIFFERENTIAL EQUATIONS)

NOTE :- Paper Setter Must select TWO Short Questions and TWO Easy Questions from Each Unit as Follows :-

UNIT	TOPICS	5 MARKS QUESTIONS	10 MARKS QUESTIONS
UNIT - I	Linear Equations	1	-
	Bernoulli's Equations	-	1
	Integrating Factor	1	-
	Exact Equations	-	1
UNIT - II	Orthogonal Trajectories	1	1
	Solvable for x, y, p.	1	1
UNIT - III	General Solution of $f(D)y=0$	1	-
	$f(D)y = Q$ when $Q = be^{ax}$	1	1
	$f(D)y = Q$ when Q is $b \sin ax$ or $b \cos ax$	-	1
UNIT - IV	$f(D)y = Q$ when $Q = bx^k$	1	-
	$f(D)y = Q$ when $Q = e^{ax} V$	1	1
	$f(D)y = Q$ when $Q = xV$	-	1
UNIT - V	Variation of Parameters (without non constant coefficient equations)	-	1
	Cauchy-Euler Equations	2	-
	Legender's Equations	-	-

1. 3 from 1
2. 1 from 1
3. 1 from 1
4. 1 from 1
5-7 from 1

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.

(w.e.f. 2016-17)

B.A./B.Sc. FIRST YEAR MATHEMATICS

SEMESTER-I MODEL QUESTION PAPER-1

(DIFFERENTIAL EQUATIONS)

TIME : 3 Hours

Max.Marks : 75

PART - A

I. Answer any FIVE Questions :

5 X 5 = 25M

1. Solve $\frac{dy}{dx} + 2xy = e^{-x^2}$.
2. Find Integrating factor of $(xy^3 + y)dx + 2(x^2y^2 + x + y^4)dy = 0$.
3. Find the Orthogonal trajectories of the family of curves $x^{\frac{2}{3}} x^{\frac{2}{3}} + y^{\frac{2}{3}} = a^{\frac{2}{3}}$ where 'a' is a parameter.
4. Solve $y = 2xP + x^2P^4$.
5. Solve $(D^4 + 8D^2 + 16)y = 0$.
6. Solve $(D^2 - 5D + 6)y = e^{4x}$.
7. Solve $(D^2 + 4)y = x \sin x$.
8. Solve $(D^2 - 4D + 4)y = x^3$.
9. Solve $(x^2D^2 - xD + 1)y = \log x$.
10. Find the complementary function (y_c) of $(x^2D^2 - 3xD + 5)y = x^2 \sin(\log x)$.

PART - B

Answer any **FIVE** of the following Questions.

Choosing at least **ONE** Question from Each Section. (5 × 10 = 50 Marks)

SECTION - A

UNIT - I

11. Solve $\frac{dy}{dx}(x^2y^3 + x^4) = 1$.
12. Solve $x^2ydx - (x^3 + y^3)dy = 0$.

UNIT - II

13. Find the orthogonal Trajectories of the families of Curves $r = \frac{2a}{1 + \cos\theta}$ when "a" is Parameter.
14. $P^2 + 2Py \cot x = y^2$.

UNIT - III

15. Solve $(D^3 + 1)y = (e^x + 1)^2$.
16. Solve $(D^2 - 3D + 2)y = \cos 3x \cdot \cos 2x$.

SECTION - B

UNIT - IV

17. Solve $\frac{d^2y}{dx^2} - 6\frac{dy}{dx} + 13y = 8e^{3x} \sin 2x$.
18. Solve $(D^2 + 1)y = x^2e^{2x} + x \cos x$.

UNIT - V

19. Solve by the method of variation of parameters $(D^2 + 1)y = \operatorname{cosec} x$.
20. Solve $[(1+x)^2 D^2 + (1+x)D + 1]y = 4 \cos \log(1+x)$.

1. 3 found
2. 1
3. u. cl. 200
4. 8/11/11
5-7/11/11

B.Sc. PHYSICS SYLLUBUS UNDER CBCS

For Mathematics Combinations

B.Sc. 1st Semester Physics

Paper I: Mechanics & Properties of Matter

Work load: 60 hrs per semester

4 hrs/week

UNIT-I (10 hrs)

1. Vector Analysis

Scalar and vector fields, gradient of a scalar field and its physical significance. Divergence and curl of a vector field with derivations and physical interpretation. Vector integration (line, surface and volume), Statement and proof of Gauss and Stokes theorems.

UNIT-II (10 hrs)

2. Mechanics of particles

Laws of motion, motion of variable mass system, Equation of motion of a rocket. Conservation of energy and momentum, Collisions in two and three dimensions, Concept of impact parameter, scattering cross-section, Rutherford scattering-derivation.

UNIT-III (16 hrs)

3. Mechanics of Rigid bodies

Definition of rigid body, rotational kinematic relations, equation of motion for a rotating body, angular momentum, Euler equations and its applications, precession of a top, Gyroscope, precession of the equinoxes.

4. Mechanics of continuous media

Elastic constants of isotropic solids and their relations, Poisson's ratio and expression for Poisson's ratio in terms of ν , n , k . Classification of beams, types of bending, point load, distributed load, shearing force and bending moment, sign conventions.

UNIT-IV (12Hrs)

5. Central forces

Central forces, definition and examples, characteristics of central forces, conservative nature of central forces, conservative force as a negative gradient of potential energy, equatorial motion under a central force. Derivation of Kepler's laws. Motion of satellites, idea of Global Positioning System (GPS).

UNIT-V (12 hrs)

6. Special theory of relativity

Galilean relativity, absolute frames. Michelson-Morley experiment, negative result. Postulates of special theory of relativity. Lorentz transformation, time dilation, length contraction, addition of velocities, mass-energy relation. Concept of four-vector formalism.

REFERENCE BOOKS :

1. B. Sc. Physics, Vol.1, Telugu Academy, Hyderabad
2. Fundamentals of Physics Vol. I - Resnick, Halliday, Krane, Wiley India 2007
3. Unified Physics, Vol. 1, S.L. Gupata & S. Guptha, Jai Prakash Nath & Co, Meerut.
4. College Physics-I. T. Bhimasankaram and G. Prasad. Himalaya Publishing House.
5. University Physics-FW Sears, MW Zemansky & HD Young, Narosa Publications, Delhi
6. Mechanics, S.G.Venkatachalapathy, Margham Publication, 2003.

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.
THREE YEAR B.Sc DEGREE EXAMINATION
FIRST YEAR EXAMINATION
SEMESTER-I :: SUB : PHYSICS(WITH MATHS) (PAPER-I)
MODEL PAPER

Time: 3 Hours

Max. Marks : 75

SECTION -A

Answer ALL the following Questions :

(5 X 10 = 50Marks)

1. (a) State and prove stokes theorem.

(OR)

(b) What is divergence of a vector field. Explain gauss divergence theorem.
2. (a) Derive an expression for the velocity of a rocket.

(OR)

(b) What is Impact parameter? Derive the equation for scattering cross-section.
3. (a) Obtain the Euler's Equation of a rotating Rigid body about a fixed point.

(OR)

(b) What is a symmetric top and derive the expression for precessional velocity.
4. (a) What is a central force? Give examples. Derive the equation of motion of particle under the action of central force.

(OR)

(b) State kepler's laws and derive the 1st law.
5. (a) Describe the Michelson – Morley experiment.

(OR)

(b) What are the postulates of special theory of relativity. Explain the time dilation.

SECTION – B

Answer any THREE of the following questions :

(3 X 5 = 15 Marks)

6. Write a short notes on gradient of Scalar field.
7. Explain the law of conservation of linear momentum.
8. Explain about precession of equinoxes.
9. Show that central force is conservative.
10. Give a brief explanation for length contraction.

SECTION – C

Answer any TWO of the following questions :

(2 X 5 = 10 Marks)

11. If $\vec{A} = y\hat{i} + (x^2 + y^2)\hat{j} + (yz + zx)\hat{k}$ then find $\text{div. } \vec{A}$ at point $(1, -2, 3)$.
12. An empty rocket weights 6000kg and contains 44,000 kg of fuel. If the exhaust velocity of gases is 1 km/s, find the maximum velocity attained by the rocket.
13. A car engine develops 75 KW power, when rotating at a speed of 1000 r.p.m. calculate the torque acting.
14. The mean distance of mars from sun is 1.524 times the distance of the earth from sun. Compute the period of revolution of mars around sun.
15. A clock showing correct time when at rest, losses one hour in a day when it is moving what is its velocity.

**Structure of Computer Science/Information Technology (IT) Syllabus I YEAR 1
SEMESTER**

Computer Fundamentals & Photoshop

Course Outcome

To explore basic knowledge on computers and Photoshop's beauty from the practical to the painterly artistic and to understand how Photoshop will help you create your own successful images

UNIT-I:

Introduction to computers, characteristics and limitations of computer, Block diagram of computer, types of computers, uses of computers, computer generations. Number systems :binary, hexa and octal numbering system

UNIT-II:

Input and output devices: Keyboard and mouse, inputting data in other ways, Types of Software: system software, Application software, commercial, open source, domain and free ware software, Memories: primary, secondary and cache memory.

Unit -III

Introduction to Adobe photoshop, Getting started with photoshop, creating and saving a document in photoshop, page layout and back ground, photoshop program window-title bar,menu bar,option bar,image window,image title bar,status bar,ruler,paletts,tool box,screen modes,saving files,reverting files,closing files.

Unit -IV

Images: working with images, image size and resolution ,image editing,colour modes and adjustments , Zooming & Panning an Image,, , Rulers, Guides & Grids- Cropping & Straightening an Image,image backgrounds ,making selections.

Working with tool box: working with pen tool, save and load selection-working with erasers-working with text and brushes-Colour manipulations: colour modes- Levels – Curves - Seeing Colour accurately - Patch tool – Cropping-Reading your palettes - Dust and scratches- Advanced Retouching- smoothing skin

Unit-V

Layers: Working with layers- layer styles- opacity-adjustment layers

Filters: The filter menu, Working with filters- Editing your photo shoot, presentation –how to create adds ,artstic filter,blur filter,brush store filter,distort filters,noise filters,pixelate filters,light effects,difference clouds,sharpen filters,printing.

Andhra Pradesh State Council of Higher Education
B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS
w.e.f.2015-2016 (Modified in April 2016)

Structure of Computer Science/Information Technology (IT) Syllabus

Reference Books:

1. Fundamentals of Computers by Reema Thareja from Oxford University Press
2. Adobe Photoshop Class Room in a Book by Adobe Creative Team.
3. Photoshop: Beginner's Guide for Photoshop - Digital Photography, Photo Editing, Color Grading & Graphic...19 February 2016 by David Maxwell

Student Activity:

1. Design a poster for technical paper presentation.
2. Create a digital scrap book.

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE

**CBCS – BSc(COMPUTER SCIENCE) - I YEAR - SEMESTER-I
COMPUTER FUNDAMENTALS & PHOTOSHOP
MODEL QUESTION PAPER**

Time: 3 Hours

Max. Marks : 75

Section-A

Answer any FIVE of the following Questions:

(5 x 5= 25 Marks)

1. Write various limitations of computers.
2. Briefly explain binary number system
3. Explain keyboard and mouse
4. Write about commercial software
5. How do you set page layout in Photoshop?
6. Write and explain how to create a document in Photoshop
7. How rulers and guides are useful in Photoshop window?
8. Explain how will you zoom an image in Photoshop.
9. Define Layer
10. Define Filter

Section - B

Answer any FIVE of the following Questions

(5 × 10 =50 Marks)

11. Draw block diagram of a computer and explain
12. Explain various types of computers.
13. What is primary memory? Explain its types
14. Define software. Explain different types of software
15. Explain various components of Photoshop program window
16. Write about reverting files
17. Explain how you change image size and resolution in Photoshop
18. Write about various colour modes.
19. Explain in detail about layers.
20. Explain the working of filters in Photoshop

Instruction to Paper Setter:

Two questions must be given from each unit in Section-A and Section-B

Photo Shop Lab

1. Create your Visiting card
 2. Create Cover page for any text book
 3. Create a Paper add for advertising of any commercial agency
 4. Design a Passport photo
 5. Create a Pamphlet for any program to be conducted by an organisation
 6. Create Broacher for you college
 7. Create Titles for any forthcoming film
 8. Custom shapes creation
 9. Create a Web template for your college
 10. Convert color photo to black and white photo
 11. Enhance and reduce the given Image size
 12. Background changes
 13. Design Box package cover
 14. Design Texture and patterns
 15. Filter effects & Eraser effects
-

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE
GENERAL ENGLISH SYLLABUS
FIRST YEAR - SEMESTER – II

Unit – I

PROSE

1. J. B.S Haldane: The Scientific Point of View
2. A.G. Gardiner : On Shaking Hands

Unit - II

POETRY

1. John Keats: Ode to Autumn
2. KishwarNaheed : I am not that Woman

(from *An Anthology of Commonwealth Poetry* edited by C.D. Narasimhaiah)

Unit –III

SHORT STORY

1. Ruskin Bond : The Boy Who Broke the Bank
2. R. K. Narayan : Half a Rupee Worth

Unit – IV

ONE ACT PLAY

Anton Chekhov: The Proposal

Unit – V

LANGUAGE ACTIVITY

1. Transformation of Sentences: (a) Voice and (b) Speech
2. Degrees of Comparison
3. Paragraph writing using the Hints.
4. Dialogue writing in a given situation.
5. Dialogue writing using the Hints.
6. Reading Comprehension (a) From Prose and (b) Unknown

VIKRAMA SIMHAPURI UNIVERSITY :: KAKUTUR

General English

(Common to FIRST YEAR – SECOND SEMESTER B.A., B.A. (OL), B.Com., B.Sc., BCA, BBA)
(A. P. Common Core Syllabus (CBCS) for I year Effective from 2015-16) (Revised in April, 2016)

Model Question Paper (2017-18)

Time: 3 Hours

Max. Marks: 75

1. Answer any TWO of the following questions. 2x5 = 10
 - a. 'Scientific point of view is morally equivalent of war.' Do you agree? Give Reasons.
 - b. What are the modes of greetings of different countries mentioned by A.G. Gardiner?
 - c. 'It is the happy mean between the Oriental's formal salaam and the Russian's enormous hug.' Elaborate this statement with reference to "On Shaking Hands".
2. Answer any TWO of the following questions. 2x5 = 10
 - a. 'Season of mists and mellow fruitfulness.' Why does Keats feel about autumn like that? Describe?
 - b. Why does the poet compare herself with a commodity in the poem 'I am not that Woman'?
 - c. How does Keats describe the autumn season in the poem 'Ode to Autumn'?
3. Answer any TWO of the following questions. 2x5 = 10
 - a. How did Subbaiah meet his tragic end in 'Half a Rupee Worth'?
 - b. Sketch the character of Nathu in 'The Boy who Broke the Bank'.
 - c. Give a brief description of the story 'Half a Rupee Worth'.
4. Answer any ONE of the following questions. 1x5 = 5
 - a. Why did Lomov want to marry his neighbour, Natalya?
 - b. What are the causes of the arguments in the play 'The Proposal'?
5. Rewrite the following sentences as directed. 5x1 = 5
 - a. He reads a story. (into Passive Voice)
 - b. The letters have been posted by him. (into Active Voice)
 - c. She invited him to the party. (into Passive Voice)
 - d. Nothing can be gained by us without effort. (into Active Voice)
 - e. We posted most of the invitation cards. (into Passive Voice)
6. Rewrite the following sentences as directed. 5x1 = 5
 - a. He said, "I have posted the letter." (into Indirect Speech)
 - b. She said to me, "Are you a student?" (into Indirect Speech)
 - c. Savitha said, "I sang a song." (into Indirect Speech)
 - d. My father said to me, "I am happy because you have got good marks." (into Indirect Speech)
 - e. "Don't make a noise" said the mother to her son. (into Indirect Speech)
7. Rewrite the following sentences as directed. 5x1 = 5
 - a. He is taller than any other boy in the class. (into Superlative Degree)
 - b. Akbar was greater than most other rulers. (into Positive Degree)
 - c. His brother is at least as tall as he. (into Comparative Degree)
 - d. A foolish friend can be more dangerous than a wise enemy. (into Positive Degree)
 - e. My pen is not so good as yours. (into Comparative Degree)

8. Write a paragraph using the hints given below. $1 \times 5 = 5$
Reading hobby – good and bad books – of the hour and forever – books as best companions – they entertain, educate and enlighten – make one forget one’s loneliness – guide and make one’s life richer – good book, a life blood of master’s spirit – Carlyle’s concept of true university, a collection of books.

9. Write a dialogue between Venu and Rajesh about their college anniversary. $1 \times 5 = 5$

10. Fill in the blanks in the following Dialogue writing. $1 \times 5 = 5$

A: Hello, who _____?

B: This is Ram.

A: Oh, hello, Ram. How _____?

B: Fine, not so bad.

A: Is Mohan at home?

B: No, he has _____ out.

A: When is he expected?

B: In about an hour, I guess.

A: Could you _____ a message to him? Ask him to call me back.

B: Sure. I’ll do that.

A: _____, Ram.

11. Reading Comprehension.

a) Read the following passage and answer the questions that follow. (From Prose) $5 \times 1 = 5$

If there is one custom that might be assumed to be beyond criticism it is the custom of shaking hands; but it seems that even this innocent and amiable practice is upon its trial. A heavy indictment has been directed against it in the Press on hygienic grounds, and we are urged to adopt some healthier mode of expressing our mutual emotion when we meet or part. I think it would need a pretty stiff Act of Parliament and a heavy code of penalties to break us of so ingrained a habit. Of course, there are many people in the world who go through life without ever shaking hands. Probably, most people in the world manage to do so. The Japanese bows, and the Indian salaams, and the Chinese makes a grave motion of the hand, and the Arab touches the breast of his friend at parting with the tips of his fingers.

a. Which custom might be assumed to be beyond criticism?

b. Why has a heavy indictment been directed against shaking hands in the press?

c. What is needed to control the custom of shaking hands?

d. What is meant by ‘ingrained’?

e. How does the Arab greet?

b) Read the following passage and answer the questions that follow. (Unknown) $5 \times 1 = 5$

Just as Mrs. Richards was entering the dining-room, there was a knock on the front door. She knew that it must be the baker. She had told him to come straight in if ever she failed to open the door and to leave the bread on the kitchen table. Not wanting to frighten the poor man, Mrs. Richards quickly hid in the small store-room under the stairs. She heard the front door open and heavy footsteps in the hall. Suddenly the door of the store-room was opened and a man entered. Mrs. Richards realized that it must be the man from the Electricity Board who had come to read the meter. She tried to explain the situation, saying ‘It’s only me’, but it was too late. The man let out a cry and jumped back several paces.

a. Where did Mrs. Richards hide when she heard a knock on the door?

b. What does it mean by ‘realize’ in the above paragraph?

c. In the sentence ‘It’s only me,’ whom does the word ‘me’ refer to?

d. When did Mrs. Richards hear a knock on the front door?

e. Who did enter when the door of the store-room was opened suddenly?

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE
Foundation Course
INFORMATION & COMMUNICATION TECHNOLOGY –1 (ICT-1)
Computer Fundamentals and Office Tools
Common for BA/BCOM/BSC/BBA
FIRST YEAR SEMESTER - II

Unit-I:

Basics of Computers :Definition of a Computer - Characteristics and Applications of Computers – Block Diagram of a Digital Computer – Classification of Computers based on size and working – Central Processing Unit – I/O Devices.

Unit-II:

Primary, Auxiliary and Cache Memory – Memory Devices. Software, Hardware, Firmware and People ware – Definition and Types of Operating System – Functions of an Operating System – MS-DOS – MS Windows – Desktop, Computer, Documents, Pictures, Music, Videos, Recycle Bin, Task Bar – Control Pane.

Unit-III:

MS-Word

Features of MS-Word – MS-Word Window Components – Creating, Editing, Formatting and Printing of Documents – Headers and Footers – Insert/Draw Tables, Table Auto format – Page Borders and Shading – Inserting Symbols, Shapes, Word Art, Page Numbers, Equations – Spelling and Grammar – Thesaurus – Mail Merge

**Unit-IV: MS-
PowerPoint**

Features of PowerPoint – Creating a Blank Presentation - Creating a Presentation using a Template - Inserting and Deleting Slides in a Presentation – Adding Clip Art/Pictures - Inserting Other Objects, Audio, Video - Resizing and Scaling of an Object – Slide Transition – Custom Animation

**Unit-V: MS-
Excel**

Overview of Excel features – Creating a new worksheet, Selecting cells, Entering and editing Text, Numbers, Formulae, Referencing cells – Inserting Rows/Columns – Changing column widths and row heights, auto format, changing font sizes, colors, shading.

Reference Books:

1. Fundamentals of Computers by ReemaThareja, Publishers : Oxford University Press, India
2. Fundamentals of Computers by V.Raja Raman, Publishers : PHI
3. Microsoft Office 2010 Bible by John Walkenbach, Herb Tyson, Michael R.Groh and FaitheWempen, Publishers : Wiley

Instruction to Paper Setter:

Two questions must be given from each unit in Section-A and Section-B

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE

Foundation Course
INFORMATION & COMMUNICATION TECHNOLOGY –1 (ICT-1)
Computer Fundamentals and Office Tools
Common for BA/BCOM/BSC/BBA
FIRST YEAR – SEMESTER-II

MODEL QUESTION PAPER

Time: 2 Hours

Max. Marks : 50

Answer any FIVE questions from the following **5x10=50**

1. Explain Block diagram of a digital Computer.
2. Explain about Input devices
3. Write about primary memory in detail.
4. Define operating system. Explain about functions of operating system.
5. Explain about features of MS-Word.
6. Write about Mail Merge Concept in MS-Word
7. How to create a presentation in MS-Power point?
8. How to add animation affects to a slide in MS-Power point?
9. What is worksheet? Explain features of MS-Excel.
10. Explain editing and formatting a Work Sheet

Instruction to Paper Setter:

Two questions must be given from each unit in Section-A and Section-B

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.
Foundation Course - 4
COMMUNICATION SKILLS AND SOFT SKILLS-1 (CSS -1)
(FOR ALL DEGREE PROGRAMMES)
I YEAR - II Semester
COURSE CONTENT (30 hours)

UNIT-1

VOCABULARY

- (a) Analogy
- (b) One-Word Substitutes
- (c) Words often confused
- (d) (I) Synonyms and (II) Antonyms

UNIT-2

GRAMMAR

- (a) Correction of sentences
- (b) Tenses

UNIT-3

GRAMMAR

- (a) Articles
- (b) Prepositions

UNIT-4

LISTENING SKILLS

- (a) The Importance of listening
- (b) Barriers / Obstacles of Effective Listening
- (c) Strategies of effective listening.

UNIT-5

READING SKILLS

- (a) Skimming
- (b) Scanning
- (c) Intensive and Extensive Reading
- (d) Reading Comprehension

* * *

Vikrama Simhapuri University :: Kakatur

Communication and Soft Skills (CSS) - 1

(Common to FIRST YEAR - SECOND SEMESTER B.A., B.A (O.L) B. Com., B.Sc.,BCA,BBA)
(A. P. Common Core Syllabus (CBCS) for I year Effective from 2015-16) (Revised in May 2016)
Model Question Paper (2017-18)

Time: 2 Hours

Max. Marks: 50

I. Answer any TWO of the following questions.

2x5=10

1. Choose the right word that has the same relationship as the original pair of words.
 - a. Honesty: Deception:: Kindness: _____. (Compassion, Cruelty, Pity)
 - b. Fox: Cunning :: Ant: _____. (Lazy / Industrious/Playful).
 - c. Player: Team :: Judge: _____. (Justice/ Jury/ Committee)
 - d. Hill: Mountain :: Sea: _____. (River/ Ocean/ Bay)
 - e. Poet: Poetess:: Lord : _____. (Lady / Count/ Gentleman)

2. Replace the underlined part of the sentence with one of the options given below the sentence.
 - a. The police arrested him for trying to kill himself.
i) death ii) suicide iii) murder
 - b. The library has undertaken a project to digitalize all the hand written matter.
i) tape-scripts ii) manuscripts iii) palm leaf scripts
 - c. She is planning to write her own life history.
i) biography ii) biodata iii) autobiography
 - d. The guest is presented with a bunch of flowers.
i) bouquet ii) branch iii) garland
 - e. It is very difficult to get water that is fit to drink in this area.
i) usable ii) potable iii) bottled

3. Fill in the blanks with either of the two words with the help of the context in each sentence.
 - a. I'm sorry I can't _____(accept / except) your proposal.
 - b. The extreme weather conditions have _____ (affected/ effected) the food grain production.
 - c. The contestants in the run are allowed to use only _____ (canvas/ canvass) shoes.
 - d. Most of the special festival meals are concluded with a _____ (desert /dessert).
 - e. The _____ (poles/ polls) are scheduled for a week by the election commission.

4. Answer the following.
 - a. Write the Synonyms of the following words.
i) Handsome ii) Polite
 - b. Write the Antonyms of the following words.
iii) Friend iv) Ancient v) Crazy

II. Answer the following Questions

2x5=10

1. Correct the following sentences and rewrite them.
 - a. I am going to college every day.
 - b. They have waited for the mail since four weeks.
 - c. Look! The two boys quarrel.
 - d. The movie started before I went into the theatre.
 - e. When I saw, they are all in a group.

2. Fill in the blanks by choosing the suitable verb forms.
 - a. I _____ (go/goes) to Hyderabad every week.
 - b. His family _____ (is/are) at Hyderabad.
 - c. One of the best students _____ (is/are) selected for the position of president of the Club.
 - d. My friends and I _____ (am/are) going to the party.
 - e. Last night a group of youngsters _____ (was/were) addressed by the Minister.

III. Answer the Following Questions.

2x5=10

1. Fill in the blanks with suitable Articles.
 - a. I talked to ____ European.
 - b. My brother came early by ____ hour.
 - c. Honesty is _____ best policy.
 - d. I met ____ one-legged man.
 - e. My teacher is _____ honest man.
2. Fill in the blanks with suitable Prepositions.
 - a. Secret of success lies ____ hard work.
 - b. She has been sleeping ____ 9 pm.
 - c. My father is suffering _____ severe fever.
 - d. There is an exception _____ every rule.
 - e. I congratulated him ____ his success.

IV. Answer any TWO of the following in 75 words each.

2x5=10

1. Describe a few barriers to listening.
2. Give some strategies for effective listening.
3. Why is listening Important?
4. What are the types of listening?

V. Answer any TWO of the following questions.

2x5=10

1. How can we become good readers? What are the qualities of good readers?
2. Write about skimming.
3. What do you know about Intensive reading and extensive reading?
4. Read the following passage and answer the questions that follow.

Beware of those who use the truth to deceive. When someone tells you something that is true, but leaves out important information that should be included, he can create a false impression. For example, someone might say, "I just won one lakh rupees on the lottery. It was great. I took that one thousand rupee ticket back to the store and turned it in for one lakh rupees!" This guy's a winner, right? Maybe, maybe not. We then discover that he bought two hundred tickets, and only one was a winner. He's really a big loser! He deliberately omitted important information. That's called a half-truth. Half-truths are just dishonest. Untrustworthy candidates in political campaigns often use this tactic. Let's say that during the last term of a Chief Minister of one of the states, that state lost one lakh jobs and gained three lakh jobs. Then he/she contests election for another term. One of his/her opponents canvasses in the public saying, "During his/ her term as the C.M, the state lost one lakh jobs!" That's true. However an honest statement would have been, "During his/her term, the state had a net gain of two lakh jobs." Advertisers will sometimes use half-truths. An ad might boast, "Nine out of ten doctors recommend 'Danta' toothpaste to cure bleeding gums." It fails to mention that they only asked ten doctors and nine of them work for the 'Danta' Corporation.

- a. As per the writer of the passage how do people create false impression?
- b. Pick out the word from the passage that means to fool or cheat people.
- c. How can you say that the person who won the lottery ticket is actually hiding full truth?
- d. Is the C.M mentioned in the passage actually responsible for a fall or growth in the number of jobs? Support your answer.
- e. As per the passage, name the two fields where people use half truths.

* * *

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.

w.e.f. 2015-16 (Revised in April, 2016)

B.A./B.Sc. FIRST YEAR MATHEMATICS SYLLABUS

SEMESTER – II, PAPER - 2

SOLID GEOMETRY

60 Hrs

UNIT – I (12 hrs) : The Plane :

Equation of plane in terms of its intercepts on the axis, Equations of the plane through the given points, Length of the perpendicular from a given point to a given plane, Distance between parallel planes, System of Planes.

Planes bisecting the angles between two Planes. Pair of Planes.

UNIT – II (12 hrs) : The Line :

Equation of a line; Angle between a line and a plane; The condition for a line to lie in a plane, Image of a point in a plane, Image of point in a line coplanar Lines

Shortest distance between two lines; The length and equations of the line of shortest distance between two straight lines; Length of the perpendicular from a given point to a given line.

UNIT – III (10 hrs) : Sphere :

Definition and equation of the sphere; the sphere through four given points; Plane sections of a sphere; Intersection of two spheres; Equation of a circle; great circle, small circle; Intersection of a sphere and a line.

UNIT – IV (10 hrs) : Sphere :

Equation of Tangent plane; Angle of intersection of two spheres; Orthogonal spheres; Coaxial system of spheres; Limiting Points.

UNIT – V (16 hrs) : Cones :

Definitions of a cone; Equation of the cone with a given vertex and guiding curve; Enveloping cone, to Find Vertex of a cone, Reciprocal Cone, Right circular cone, Equation of the Right Circular cone one with a given vertex axis and semi vertical angle the cylinder.

Cylinder :

Definition of a cylinder, Equation to the cylinder, Enveloping cylinder, right circular cylinders equation of the right circular cylinder.

Note : Concentrate on Problematic parts in all above units.

Prescribed Text Book :

1. V. Krishna Murthy & Others "A text book of Mathematics for BA/B.Sc Vol 1, Published by S. Chand & Company, New Delhi.

Reference Books : 1. Scope as in Analytical Solid Geometry by Shanti Narayan and P.K. Mittal Published by S. Chand & Company Ltd. Seventeenth Edition.

Sections :- 2.4, 2.5, 2.6, 2.7, 2.8, 3.1 to 3.7, 6.1 to 6.9, 7.1 to 7.4, 7.6 to 7.8.

2. P.K. Jain and Khaleel Ahmed, "A text Book of Analytical Geometry of Three Dimensions", Wiley Eastern Ltd., 1999.

3. Co-ordinate Geometry of two and three dimensions by P. Balasubrahmanyam, K.Y. Subrahmanyam, G.R. Venkataraman published by Tata-MC Gran-Hill Publishers Company Ltd., New Delhi.

4. Telugu Academy Text Book for Solid Geometry.

5. I-B.Sc A text Book of a Mathematics Deepthi Publications

1. S. Chand
2. P.K. Jain & Khaleel Ahmed
3. U. C. Chel
4. Shanti
5-711 de

**BLUE PRINT OF QUESTION PAPER
(INSTRUCTIONS TO PAPER SETTER)
B.A./B.Sc. MATHEMATICS SEMESTER-II
(SOLID GEOMETRY)**

NOTE :- Paper Setter Must select TWO Short Questions and TWO Easy Questions from Each Unit as Follows :-

UNIT	TOPICS	5 MARKS QUESTIONS	10 MARKS QUESTIONS
UNIT - I	Planes Introductions	2 (Prb)	-
	System of Planes & Bisecting Planes	-	1(Prb)
	Pair of Planes	-	1(Prb)
UNIT - II	Straight Lines First Part	2 (Prb)	-
	Image & coplaner Lines	-	1(Prb)
	Shortest Distance	-	1(Prb)
UNIT - III	Sphere Introduction	1(Prb)	-
	Plane Section of a Sphere	1(Prb)	1(Prb)
	Great Circle & Small Circle	-	1(Prb)
UNIT - IV	Tangent Plane	1(Prb)	-
	Angle of Intersection of Two Spheres & Orthogonal Spheres	1(Prb)	1(Prb)
	Limiting Points	-	1(Prb)
UNIT - V	Cone	1(Prb)	1(Prb)
	Cylinder	1(Prb)	1(Prb)

1. Sphere
2. ~~Plane~~
3. U. of plane
4. Sphere
- 5-711 d

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE
B.A./B.Sc. FIRST YEAR MATHEMATICS
MODEL QUESTION PAPER
SEMESTER-II
SOLID GEOMETRY

Time: 3 Hours

Max. Marks : 75

PART-A

Answer any FIVE of the following Questions :

(5 x 5= 25 Marks)

1. Find the Equation of the plane through the point $(-1,3,2)$ and perpendicular to the planes $x+2y+2z=5$ and $3x+3y+2z=8$.
2. Find the angles between the planes $x+2y+3z=5$, $3x+3y+z=9$.
3. Show that the line $\frac{x+1}{-1} = \frac{y+2}{3} = \frac{z+5}{5}$ lies in the plane $x+2y-z=0$.
4. Find the point of intersection with the plane $3x+4y+5z=5$ and the line $\frac{x+1}{1} = \frac{y+3}{3} = \frac{z-2}{2}$.
5. Find the centre and radius of the sphere $2x^2+2y^2+2z^2-2x+4y+2z+1=0$.
6. Find the equation of the sphere through the circle $x^2+y^2+z^2=9$, $2x+3y+4z=5$ and the point $(1,2,3)$
7. Find the equation of the tangent plane to the sphere $3x^2+3y^2+3z^2-2x-3y-4z=22=0$ at the point $(1,2,3)$
8. Show that the spheres are orthogonal $x^2+y^2+z^2+6y+2z+8=0$;
 $x^2+y^2+z^2+6x+8y+4z+20=0$.
9. Find the equation of the cone which passes through the three co-ordinate axis and the lines $\frac{x}{1} = \frac{y}{-2} = \frac{z}{3}$ and $\frac{x}{2} = \frac{y}{1} = \frac{z}{1}$.
10. Find the equation of the cylinder whose generators are parallel to $\frac{x}{1} = \frac{y}{2} = \frac{z}{3}$ and which Passes through the curve $x^2+y^2=16, z=0$.

PART - B

- II. Answer any FIVE of the following Questions.
Choosing at least ONE Question from Each Section. (5 × 10 = 50 Marks)

SECTION - A

UNIT - I

11. Find the equation of the plane passing through the intersection of the planes $x + 2y + 3z = 4$, $2x + y - z + 5 = 0$ and perpendicular to the plane $6z + 5x + 3y + 8 = 0$.
12. Prove that Equation $2x^2 - 6y^2 - 12z^2 + 18yz + 2zx + xy = 0$ represents a pair of planes and find the angle between them.

UNIT - II

13. Find the image of the point (2, -1, 3) in the plane $3x - 2y + z = 9$.
14. Find the length and equation to the line of shortest distance between the lines $\frac{x-2}{3} = \frac{y-3}{4} = \frac{z-1}{2}$, $\frac{x-4}{4} = \frac{y-3}{5} = \frac{z-2}{3}$

UNIT - III

15. Find the equation of the sphere through the circle $x^2 + y^2 + z^2 + 2x + 3y + 6 = 0$, $x - 2y + 4z - 9 = 0$ and the centre of the sphere $x^2 + y^2 + z^2 - 2x + 4y - 6z + 5 = 0$.
16. Find whether the following circle is a great circle or small circle $x^2 + y^2 + z^2 - 4x + 6y - 8z + 4 = 0$, $x + y + z = 3$.

SECTION - B

UNIT - IV

17. Find the equation of the sphere which touches the plane $3x + 2y - z + 2 = 0$ at (1, -2, 1) and cuts orthogonally the sphere $x^2 + y^2 + z^2 - 4x + 6y + 4 = 0$.
18. Find limiting points of the co axial system of spheres $(x^2 + y^2 + z^2 - 20x + 30y + 40z + 29) + \lambda(2x - 3y - 4z) = 0$

UNIT - V

19. Find the vertex of the cone $7x^2 + 2y^2 + 2z^2 - 10zx + 10xy + 26x - 2y + 2z - 17 = 0$.
20. Find the equation to the right circular cylinder whose guiding circle $x^2 + y^2 + z^2 - 9$, $x - y + z = 3$.

1. Sphere
2. ~~Plane~~
3. U. C. circle
4. Skew
5. Y.A. C.

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.

SUB : PHYSICS (CBCS) Paper II: Waves & Oscillations

(With Maths Combination)

FIRST YEAR - II SEMESTER

Work load: 60 hrs per semester

4 hrs/week

UNIT-I (12 hrs)

1. Simple Harmonic oscillations

Simple harmonic oscillator and solution of the differential equation-Physical characteristics of SHM, torsion pendulum-measurements of rigidity modulus, compound pendulum- measurement of g Principle of superposition,beats, combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies. Lissajous figures.

UNIT-II (12 hrs)

2. Damped and forced oscillations

Damped harmonic oscillator, solution of the differential equation of damped oscillator. Energy considerations, comparison with un-damped harmonic oscillator, logarithmic decrement, relaxation time, quality factor, differential equation of forced oscillator and its solution, amplitude resonance and velocity resonance.

UNIT-III (10 hrs)

1. Complex vibrations

Fourier theorem and evaluation of the Fourier coefficients, analysis of periodic wave functions-square wave, triangular wave, saw tooth wave, simple problems on evolution of Fourier coefficients.

UNIT-IV (17hrs)

4. Vibrating strings: 8 hrs

Transverse wave propagation along a stretched string, general solution of wave equation and its significance, modes of vibration of stretched string clamped at ends, overtones and harmonics. Energy transport and transverse impedance.

5. Vibrations of bars: 9 hrs

Longitudinal vibrations in bars-wave equation and its general solution. Special cases (i) bar fixed at both ends (ii) bar fixed at the midpoint (iii) bar fixed at one end. Tuning fork.

UNIT-V (9 hrs)

6. Ultrasonics: 9hrs

Ultrasonics, properties of ultrasonic waves, production of ultrasonics by piezoelectric and magnetostriction methods, detection of ultrasonics, determination of wavelength of ultrasonic waves.Applications of ultrasonic waves.

REFERENCE BOOKS:

1. BSc Physics Vol.1, Telugu Academy, Hyderabad.
2. Waves and Oscillations. N. Subramanyam and Brijlal, Vikas Pulications.
3. Unified Physics Vol., Mechanics, Waves and Oscillations, Jai Prakash Nath&Co.Ltd.
4. Fundamentals of Physics. Halliday/Resnick/Walker ,Wiley India Edition 2007.
5. Waves & Oscillations. S.Badami, V. Balasubramanian and K.R. Reddy,Orient Longman.
6. College Physics-I. T. Bhimasankaram and G. Prasad. Himalaya Publishing House.
7. Science and Technology of Ultrasonics- Baldevraj, Narosa, New Delhi,2004
8. Introduction to Physics for Scientists and Engineers. F.J. Buche. McGraw Hill.

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.
THREE YEAR B.Sc.(CBCS) DEGREE EXAMINATION
FIRST YEAR SEMESTER - II
SUB : PHYSICS PAPER II: WAVES & OSCILLATIONS
(WITH MATHS COMBINATION)
MODEL PAPER

Time : 3 hours

Max Marks : 75

SECTION-A (ESSAY TYPE)

ANSWER ALL QUESTIONS :

MARKS : 10 X 5 = 50M

1. (a) What is simple harmonic oscillator and write the solution for equation of S.H.O.
(OR)
(b) Describe an experiment to determine acceleration due to gravity using a compound Pendulum.
2. (a) Find the equation of motion for a damped harmonic oscillator and find its solution.
(OR)
(b) Explain (i) Amplitude Resonance (ii) Velocity Resonance.
3. (a) Using Fourier's theorem analyse a square wave.
(OR)
(b) Analyse a saw-tooth wave using Fourier's theorem.
4. (a) Discuss the energy transport in the strings and obtain an expression for energy density.
(OR)
(b) Discuss briefly the longitudinal modes of vibration of bar fixed at both the ends.
5. (a) What are ultra Sonics? Describe the magnetostriction method of producing Ultra Sonics.
(OR)
(b) Discuss the various types of methods used to detect ultra Sonics.

SECTION-B (SHORT ANSWER TYPE)

ANSWER ANY THREE QUESTIONS :

MARKS : 5 X 3 = 15M

6. Explain the logarithmic decrement.
7. Write a short note on lissajous Figures.
8. What is transverse impedance.
9. Explain quality factor.
10. Write the applications of ultra Sonics.

SECTION-C

ANSWER ANY TWO QUESTIONS :

MARKS : 5 X 2 = 10M

11. A particle executes S.H.M. with a period of 0.001s and amplitude 0.5 cm. Find its acceleration and also find its maximum velocity.
12. A capacitor of $3\mu F$ is discharged through 1Ω resistance and 3 Henry in inductance. Calculate the frequency of oscillation.
13. Determine the Fourier series for $f(x) = e^x$ in the interval $-\pi < x < \pi$.
14. A string of length 150cm and mass 5gm kept under tension 1200N. Find the velocity of transverse wave in the string.
15. A piezo - electric crystal has a thickness 0.05m and velocity of sound wave in crystal is $5.5 \times 10^3 m / s$. Then find the fundamental and first over tone frequency of crystal.

**Structure of Computer Science/Information Technology (IT) Syllabus I YEAR II
SEMESTER**

Paper-II : PROGRAMMING IN C

Course Objectives

1. Learn how to solve common types of computing problems.
2. Learn data types and control structures of C
3. Learn to map problems to programming features of C.
4. Learn to write good portable C programs.

Course Outcomes

Upon successful completion of the course, a student will be able to:

1. Appreciate and understand the working of a digital computer
2. Analyze a given problem and develop an algorithm to solve the problem
3. Improve upon a solution to a problem
4. Use the 'C' language constructs in the right way
5. Design, develop and test programs written in 'C'

UNIT I

Introduction to Algorithms and Programming Languages: Algorithm – Key features of Algorithms – examples of Algorithms – Flow Charts – Programming Languages – Generation of Programming Languages – Structured Programming Language.

Introduction to C: Introduction – Structure of C Program – Writing the first C Program – File used in C Program – Compiling and Executing C Programs – Using Comments – Keywords – Identifiers – Basic Data Types in C – Variables – Constants – I/O Statements in C- Operators in C- Programming Examples – Type Conversion and Type Casting

UNIT II

Decision Control and Looping Statements: Introduction to Decision Control Statements – Conditional Branching Statements – Iterative Statements – Nested Loops – Break and Continue Statement – Goto Statement

Functions: Introduction – using functions – Function declaration/ prototype – Function definition – function call – return statement – Passing parameters – Scope of variables – Storage Classes – Recursive functions.

UNIT III

Arrays: Introduction – Declaration of Arrays – Accessing elements of the Array – Storing Values in Array – Calculating the length of the Array – Operations on Array – one dimensional array for inter-function communication – Two dimensional Arrays –Operations on Two Dimensional Arrays -

Strings: Introduction – String Operations –String and Character functions

Andhra Pradesh State Council of Higher Education
B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS
w.e.f.2015-2016 (Modified in April 2016)

Structure of Computer Science/Information Technology (IT) Syllabus

UNIT IV

Pointers: Understanding Computer Memory – Introduction to Pointers – declaring Pointer Variables – Pointer Expressions and Pointer Arithmetic – Null Pointers – Passing Arguments to Functions using Pointer – Pointer and Arrays – Passing Array to Function – Array Of Function Pointer – Pointers to Pointers – Memory Allocation in C Programs – Memory Usage – Dynamic Memory Allocation – Drawbacks of Pointers

Structure, Union, and Enumerated Data Types: Introduction – Nested Structures – Arrays of Structures – Self referential Structures – Union – Enumerated Data Types

UNIT V

Files: Introduction to Files – Using Files in C – Reading Data from Files – Writing Data from Files – Detecting the End-of-file – Error Handling during File Operations.

TEXT BOOKS

1. Introduction to C programming by REEMA THAREJA from OXFORD UNIVERSITY PRESS
2. E Balagurusamy: —COMPUTING FUNDAMENTALS & C PROGRAMMING – Tata McGraw-Hill, Second Reprint 2008, ISBN 978-0-07-066909-3.

REFERENCE BOOKS

1. Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson Edition Publ, 2002.
2. Henry Mullish & Huubert L.Cooper: The Spirit of C An Introduction to modern Programming, Jaico Pub. House,1996.

Student Activity:

1. Write a program for preparing the attendance particulars of students of your college at the end of semester according to following guidelines
 - a. Above 75 % promoted
 - b. Above 65% condoned
 - c. Below 65% detained
 2. Write a program for creating timetable or your class taking work load of faculty into consideration.
-

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE
CBCS - BSc(Computer Science) - I YEAR - SEMESTER-II (w.e.f. 2016-'17)
PROGRAMMING IN C
MODEL QUESTION PAPER

Time: 3 Hours

Max. Marks : 75

Section-A

Answer any FIVE of the following Questions:

(5 x 5= 25 Marks)

1. What is constant? Explain various constants used in C language
2. Define flowchart. Write various symbols used in flow chart.
3. Explain about switch statement with an example
4. Write a C program to find sum of first 'n' natural numbers
5. Differentiate one-dimensional and two-dimensional arrays
6. Write about various character functions
7. Define pointer. Explain declaration of a pointer variable in C
8. Write differences between structure and union
9. Explain the use of files in C language
10. Explain how to detect end of file thru a program

Section - B

Answer any FIVE of the following Questions

(5 × 10 =50 Marks)

11. Explain about structure of a C program with an example
12. Write about basic data types used in C language
13. Explain various decision control statements used in C language
14. What is function? Explain how a function is declared in C
15. What is an array? Explain how one-dimensional arrays are used in a C program
16. Define string. Explain various string operations
17. Explain dynamic memory allocation in C
18. What is a structure? Explain with an example
19. Explain how to read data from files in a C program
20. Write about error handling in file operations

Instruction to Paper Setter:

Two questions must be given from each unit in Section-A and Section-B

Structure of Computer Science/Information Technology (IT) Syllabus

PROGRAMMING IN C LAB

1. Find out the given number is perfect number or not using c program.
 2. Write a C program to check whether the given number is Armstrong or not.
 3. Write a C program to find the sum of individual digits of a positive integer.
 4. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to print the Fibonacci series
 5. Write a C program to generate the first n terms of the Fibonacci sequence.
 6. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
 7. Write a C program to find both the largest and smallest number in a list of integers.
 8. Write a C program that uses functions to perform the following:
 - a. Addition of Two Matrices
 - b. Multiplication of Two Matrices
 9. Write a program to perform various string operations
 10. Write C program that implements searching of given item in a given list
 11. Write a C program to sort a given list of integers in ascending order
-

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE
General English Syllabus for B.A/ B.A. (OL)/B.Com/B.Sc/BBA/BCA Courses under
CBCS w.e.f. 2015-16 (Revised in April-2016)

SEMESTER –III

Unit – I

PROSE

1. M.K. Gandhi: Shyness My Shield (from *The Story of My Experiments with Truth*)
2. Alexis C. Madrigal: Why People Really Love Technology: An Interview with Genevieve Bell

Unit – II

POETRY

1. Gabriel Okara: Once upon a Time
2. Seamus Heaney: Digging

Unit – III

SHORT STORY

1. JhumpaLahiri: The Interpreter of Maladies
2. Shashi Deshpande: The Beloved Charioteer

Unit – IV

ONE ACT PLAY

GurajadaAppa Rao: *Kanyasulkam*, translated by C. Vijayasree& T. VijayaKumar (Acts I & II)

Unit – V

LANGUAGE ACTIVITY

1. Classroom and Laboratory Activities
 - i. JAM Session
 - ii. Expansion of an idea
2. Classroom Activity
 - i. Transformation of sentences (Simple-Complex-Compound Sentences)
 - ii. Note Making
 - iii. Report Writing (Letter Format and paragraph Format)
 - iv. Reading Comprehension (From Prose)

Note: *In classroom instruction it may be ensured that the theoretical and practical components of CSS-II complement the language activity in this semester.*

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VIKRAMA SIMHAPURI UNIVERSITY :: KAKUTUR

General English

(Common to SECOND YEAR – THIRD SEMESTER B.A., B.A. (OL), B.Com., B.Sc.,BBA,BCA)
(A. P. Common Core Syllabus (CBCS) for I year Effective from 2015-16) (Revised in April, 2016)

Model Question Paper (2017-18)

Time: 3 Hours

Max. Marks: 75

1. Answer any TWO of the following questions. 2X5 = 10
 - a. Summarize the main ideas of the essay 'Shyness, My Shield'.
 - b. What are the ideas of Genevieve Bell about gadget adoption and ubiquitous computing?
 - c. Describe the instances of Gandhi's shyness during his stay in England.
2. Answer any TWO of the following questions. 2X5 = 10
 - a. What does the father tell his son in the poem 'Once upon a Time'?
 - b. 'Between my finger and my thumb the squat pen rests. I'll dig with it'. Explain it with reference to the poem 'Digging'.
 - c. What assumptions can you make about the kind of life that the poet of the poem 'Once upon a Time' has lived? How is it different now?
3. Answer any TWO of the following questions. 2X5 = 10
 - a. Discuss the title of the story 'The Interpreter of Maladies'.
 - b. What feelings does the child have towards her mother in 'The Beloved Charioteer'?
 - c. What cultural differences do you notice among the characters in 'The Interpreter of Maladies'?
4. Answer any ONE of the following questions. 1X5 = 5
 - a. How is 'Kanyasulkam' a critique of society?
 - b. Write a note on the comic elements in the play 'Kanyasulkam'.
5. Prepare notes for JAM on ONE of the following. 1X5 = 5
 - a. My Career Choice
 - b. My Childhood
 - c. Smart Phone
6. Write a report to the news paper on your college day celebrations highlighting the important events. 1X5=5
7. Write about any TWO of the following. 2X5 = 10
 - a. Prevention is better than cure.
 - b. Where there is a will, there is a way.
 - c. Necessity is the mother of invention.
 - d. My Hobbies
 - e. The uses of Internet
8. Rewrite the following sentences as directed: 5x1 = 5
 - a. He is poor but he is honest. (into Simple Sentence)
 - b. As he was ill, he was absent. (into Compound Sentence)
 - c. The thief saw the police and he ran away. (into Simple Sentence)
 - d. He ran away in order to escape arrest. (into Compound Sentence)
 - e. You must work hard, and then you will pass. (into Complex Sentence)

9. Read the following passage and make notes of it.

1x5 = 5

There are different forms of environmental pollution. Air pollution is caused by the burning of coal and oil. It can damage the earth's vegetation and cause respiratory problems in humans. A second type of pollution is noise pollution. It is the result of the noise of aircraft and heavy traffic. Further, loud music is also a cause of noise pollution, which has been seen to affect people's hearing and give them severe headaches and high blood pressure. Another source of pollution is radioactivity, which occurs when there is a leak from a nuclear power station. Radioactivity is a deadly pollutant, which kills and causes irreparable harm to those exposed to it. Land and water pollution is caused by the careless disposal of huge quantities of rubbish, sewage and chemical wastes. Pollution of river and seas kills fishes and other marine life and also becomes the cause of water-borne diseases. Land pollution, on the other hand, poisons the soil, making the food grown in it unfit for consumption.

10. Write a Report on ragging in the educational institutions. (Paragraph Format).

1x5 = 5

11. Read the following passage and answer the questions that follow. (From Prose)

5x1 = 5

There were in the Committee others also who shared my view, but I felt myself personally called upon to express my own. How to do it was the question. I had not the courage to speak and I therefore decided to set down my thoughts in writing. I went to the meeting with the document in my pocket. So far I recollect, I did not find myself equal even to reading it, and the President had it read by someone else. Dr. Allinson lost the day. Thus in the very first battle of the kind I found myself siding with the losing party. But I had comfort in the thought that cause was right. I have a faint recollection that, after this incident, I resigned from the Committee.

- a. Who is 'I' in the given passage?
- b. What did the author do as he had not the courage to speak?
- c. How did he go to the meeting?
- d. When the author failed to read the document, what did the President do?
- e. When did the author resign from the Committee?

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VIKRAMA SIMHAPURI UNIVERSITY
NELLORE - 524 001
PART-II SANSKRIT
CBCS SEMESTER WISE SYLLABUS
II-YEAR – SEMESTER-III
PAPER - III DRAMA, UPANISHAD, ALANKARAS, PARTICIPLES &
SABDAS
(B.A., B.SC., B.COM)

Unit-I	Old Drama	Dootavakyam One act play by Bhasa
Unit-II	Modern Drama	Asani Niraasam By Kavisamrat Viswanatha Satyanarayana, Pub. in 1954
Unit-III	Upanishad	Sishyaanusaasanam - Sikshavalli of Taittireeyupanishat
Unit-IV	Alankaras	1) Upama, 2) Ananvaya, 3) Utpreksha, 4) Deepakam, 5) Aprastuta Prasamsa, 6) Drushtanta.
Unit-V	Participles Krtpratyayas	1) Ktvaa, 2) Lyap, 3) Tuman, 4) Tavva.
	Sabdhas :	
	1) Halanta	1) Vach, 2) Marut, 3) Bhavat, 4) Rajan, 5) Vidwas, 6) Manas
	2) Sarvanama	1) Asmad, 2) Yushmad

History of Sanskrit Literature :

- 1) पाणिनिः, 2) कौटिल्यः, 3) भरतमुनिः, 4) भारविः, 5) माधः, 6) भवभूतिः.

VIKRAMA SIMHAPURI UNIVERSITY
NELLORE - 524 001
SANSKRIT

CBCS SEMESTER WISE SYLLABUS

3RD SEMESTER

PATRON OF THE QUESTION PAPER

Time : 3hrs

Max Marks : 75

- | | | | | |
|-------|--|------------|--------|---------|
| I. | Essay | 1 out of 2 | 1x 10 | 10M |
| | from the Lesson : Dutavakyam of Bhasa | | | |
| II. | Essay | 1 out of 2 | 1 x 10 | 10M |
| | from the Lesson : Asaninirasam | | | |
| III. | Essay | 1 out of 2 | 1 x 8 | 08M |
| | One from each Lesson : 1) Shisyanusasanam | | | |
| IV. | Short Answers | 4 out of 6 | 4 x 2 | 08M |
| | Two from Each Lesson : | | | |
| V. | Annotations | 4 out of 6 | 4 x 3 | 12 M |
| | Two from each lesson | | | |
| VI. | Full form of Sabdas | 2 out of 4 | 2 x 3 | 06M |
| | One from each Gender and one from Sarvanama. | | | |
| VII. | Participles | 3 out of 6 | | 3x1 = 3 |
| | Two from each Participle | | | |
| VIII. | Alankaras | 2 out of 4 | | 2x5=10 |
| | Eleborate explanation should be given. | | | |
| IX. | History of Sanskrit Literature | 2 out of 4 | | 2x4=8 |
| | A Brief explanation of a Poet should be given. | | | |

Note : Question Paper should be Sanskrit Only. English Translation should not be there.

Foundation Course - 5

INFORMATION & COMMUNICATION TECHNOLOGY –2 (ICT-2)

Internet Fundamentals and Web Tools

Common for BA / BCom / B Sc / BBA Programmes

III Semester

(30 Hours of Teaching Learning including Lab)

Unit-I :

Fundamentals of Internet : Networking Concepts, Data Communication – Types of Networking, Internet and its Services, Internet Addressing – Internet Applications – Computer Viruses and its types – Browser –Types of Browsers.

Unit-II:

Internet applications: Using Internet Explorer, Standard Internet Explorer Buttons, Entering a Web Site Address, Searching the Internet – Introduction to Social Networking: twitter, tumblr, LinkedIn, facebook, flickr, skype, yelp, vimeo, yahoo!, google+, youtube, WhatsApp, etc.

Unit-III :

E-mail :Definition of E-mail - Advantages and Disadvantages – UserIds, Passwords, Email Addresses, Domain Names, Mailers, Message Components, Message Composition, Mail Management, Email Inner Workings.

Unit IV:

WWW- Web Applications, Web Terminologies, Web Browsers, URL – Components of URL, Searching WWW – Search Engines and Examples

Unit-III :

Basic HTML: Basic HTML – Web Terminology – Structure of a HTML Document – HTML, Head and Body tags – Semantic and Syntactic Tags – HR, Heading, Font, Image and Anchor Tags – Different types of Lists using tags – Table Tags, Image formats – Creation of simple HTML Documents.

Reference Books :

1. In-line/On-line : Fundamentals of the Internet and the World Wide Web, 2/e - by Raymond Greenlaw and Ellen Hepp, Publishers : TMH

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE
FOUNDATION COURSE
INFORMATION & COMMUNICATION TECHNOLOGY -2 (ICT-2)
Internet Fundamentals and Web Tools
Common for BA / BCom / B Sc / BBA Programmes

SEMESTER-III (MODEL QUESTION PAPER)

Time: 2 Hours

Max. Marks : 50

Answer any FIVE of the following Questions: (5 x 10 = 50 Marks)

1. What is Network? Explain types of networks
2. Write about Internet applications.
3. Briefly explain features of Internet Explorer
4. Explain about any two Social networking sites
5. What is E-mail? Write advantages of E-mail.
6. Write about message components.
7. Define WWW. Write about web browsers.
8. What is Search engine? Explain search engines used on Internet.
9. Explain the structure of HTML document.
10. Explain list tags used in HTML

Instruction to Paper Setter:

TWO questions must be given from each unit

Foundation Course - 6
COMMUNICATION SKILLS AND SOFT SKILLS-2 (CSS -2)
Common for BA/BCom/BSc/BBA/BCA Programmes

III Semester
COURSE CONTENT (30 hours)

Unit I: Pronunciation - 1

The Sounds of English

Unit II: Pronunciation – 2

1. Word Accent
2. Intonation

Unit III: Speaking Skills -1

1. Conversation Skills
2. Interview Skills
3. Presentation Skills
4. Public Speaking

Unit IV: Speaking Skills -2

1. Role Play
2. Debate
3. Group Discussion

Unit V: Writing Skills

1. Spelling
2. Punctuation
3. Information Transfer
4. Tables
5. Bar Diagrams
6. Line Graphs
7. Pie Diagrams
8. Flow Charts
9. Tree Diagrams
10. Pictures

* * *

VIKRAMA SIMHAPURI UNIVERSITY :: KAKUTUR

Communication and Soft Skills (CSS) - 2

(Common to SECOND YEAR - THIRD SEMESTER B.A., B.A (O.L) B.Com., B.Sc.,BBA,BCA)
(A. P. Common Core Syllabus (CBCS) for I year Effective from 2015-16) (Revised in May 2016)

Model Question Paper (2017-18)

Time: 2 Hours

Max. Marks: 50

I. Answer the following questions.

2X5=10

1. Write English spelling for the words given in phonemic transcription.

i) /a:tɪst/ ii) /kaɪndnəs/ iii) /pəzɪfən/ iv) /θɔ:n/ v) ba:bə/

2. Choose correct transcription for each word.

i) Apple a) /a:pl/ b) /a:pɪl/ c) /æpl/
ii) Album a) /ʌlbəm/ b) /a:lbəm/ c) /ælbəm/
iii) College a) /kə:le:dʒ/ b) /ca:lɪdʒ/ c) /kɒlɪdʒ/
iv) Museum a) /mju:ziəm/ b) /mju:siəm/ c) /mu:sium/
v) Summer a) /sʌmə/ b) /sʌmə/ c) /sʌmmə/

II. Answer the following questions.

2X5=10

1. Mark the stress on the appropriate syllable in the following words.

a) Particular b) Canteen c) Police d) Traditional e) Propriety

2. Choose correct tone (Falling/ Rising) for each of the following sentences.

a. Ravi Kumar is a good doctor.
b. Have you taken breakfast?
c. Where are you going?
d. What's your name? (Warmth and affection).
e. Shut the door, please.

III. Answer any TWO of the following questions.

2X5=10

1. What are the dos and don'ts during an interview?
2. How do you develop your presentation skills?
3. When you are asked to address a gathering, what are the tips to be followed?

IV. Answer any TWO of the following questions.

2X5=10

1. Write a dialogue between two friends about an accident that took place in their town.
2. 'Using social media is a waste of time.' Prepare five debate points.
3. What are the dos and don'ts in a group discussion?

V. Answer the following questions.

2X5=10

1. Present the given information in the form of a tree diagram.

There are three main types of geometrical figures. They are circle, triangle and quadrilateral. Equilateral, isosceles and scalene are the triangle forms that are used. The circle has no such sub forms. Quadrilateral can be represented by square, rectangle, rhombus and Parallelogram.

2. Identify the Correct spelling in each group.

a. i. Monotonos	ii. Monotonus	iii. Monotonous
b. i. Syllable	ii. Syllabel	iii. Syllabul
c. i. Vocabolary	ii. Vocablary	iii. Vocabulary
d. i. Grammer	ii. Grammar	iii. Grammor
e. i. Receive	ii. Recieve	iii. Receave

* * *

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE

(w.e.f. 2016-17)

B.A./B.Sc. SECOND YEAR MATHEMATICS SYLLABUS

SEMESTER – III, PAPER - 3

ABSTRACT ALGEBRA

60 Hrs

UNIT – 1 : (10 Hrs) GROUPS :-

Binary Operation – Algebraic structure – semi group-monoid – Group definition and elementary properties Finite and Infinite groups – examples – order of a group. Composition tables with examples.

UNIT – 2 : (14 Hrs) SUBGROUPS :-

Complex Definition – Multiplication of two complexes Inverse of a complex-Subgroup definition – examples-criterion for a complex to be a subgroups.

Criterion for the product of two subgroups to be a subgroup-union and Intersection of subgroups. Co-sets and Lagrange's Theorem :-

Cosets Definition – properties of Cosets – Index of a subgroups of a finite groups– Lagrange's Theorem Statement and Proof.

UNIT – 3 : (12 Hrs) NORMAL SUBGROUPS :-

Definition of normal subgroup – proper and improper normal subgroup–Hamilton group – criterion for a subgroup to be a normal subgroup – intersection of two normal subgroups – Sub group of index 2 is a normal sub group – simple group – quotient group – criteria for the existence of a quotient group.

UNIT – 4 : (10 Hrs) HOMOMORPHISM :-

Definition of homomorphism – Image of homomorphism elementary properties of homomorphism – Isomorphism – automorphism definitions and elementary properties–kernel of a homomorphism – fundamental theorem on Homomorphism and applications.

UNIT – 5 : (14 Hrs) PERMUTATIONS AND CYCLIC GROUPS :-

Definition of permutation – permutation multiplication – Inverse of a permutation – cyclic permutations – transposition – even and odd permutations.

Cayley's Theorem and Cyclic Groups :-

Definition of cyclic group – elementary properties.

Prescribed Text Book :

1. A text book of Mathematics for B.A. / B.Sc. by B.V.S.S. SARMA and others, Published by S.Chand & Company, New Delhi.

Reference Books :

1. Abstract Algebra, by J.B. Fraleigh, Published by Narosa Publishing house.

2. Modern Algebra by M.L. Khanna.

3. Telugu Academy Text Book for Abstract Algebra.

4. I-B.Sc A text Book of a Mathematics Deepthi Publications.

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on Group theory and its applications in Graphics and Medical image Analysis

Instruction to Paper Setter:

Two questions must be given from each unit in Part-A and Part-B

1. 3 questions
2. 1 question
3. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20.
4. 20
5-7/10 de

**BLUE PRINT OF QUESTION PAPER
(INSTRUCTIONS TO PAPER SETTER)
B.A./B.Sc. MATHEMATICS SEMESTER-III
(ABSTRACT ALGEBRA)**

NOTE :- Paper Setter Must select TWO Short Questions and TWO Easy Questions from Each Unit as Follows :-

| UNIT | TOPICS | 5 MARKS QUESTIONS | 10 MARKS QUESTIONS |
|------------|--|-----------------------------|--------------------|
| UNIT - I | Group Definition and Elementary Properties | 1 (Theorem) | - |
| | Composition Tables | 1(Problem) | - |
| | Problems | - | 2 (Problems) |
| UNIT - II | Subgroups | 1 (Theorem) | 2 (Theorems) |
| | Cosets & Lagrange's Theorem | 1 (Theorem) | - |
| UNIT - III | Normal Subgroups | 2 (Theorems) | 2 (Theorems) |
| UNIT - IV | Homomorphism | 1(Problem) +
1 (Theorem) | 2 (Theorems) |
| UNIT - V | Permutations | 2 (Problems) | 1 (Problem) |
| | Cayley's Theorem & Cyclic Groups | - | 1 (Theorem) |

1. 3 from all
2. ~~1 from all~~
3. 11. 11. 11. 11. 11
4. 11. 11. 11. 11. 11
- 5-7. 11. 11. 11. 11. 11

PART - B

Answer any **FIVE** of the following Questions.

Choosing at least **ONE** Question from Each Section. (5 × 10 = 50 Marks)

SECTION - A

UNIT - I

11. Define abelian group. Prove that the set of n^{th} roots of unity under multiplication form a finite abelian group.
12. Show that the set of all positive rational numbers form an abelian group under the composition '0' defined by $a \circ b = \frac{ab}{2}$.

UNIT - II

13. Prove that a non-empty finite subset of a group which is closed under multiplication is a subgroup of G.
14. Prove that the union of two subgroups of a group is a subgroup if one is contained in the other.

UNIT - III

15. Prove that a subgroup H of a group G is a normal subgroup of G if and only if each left coset of H in G is a right coset of H in G.
16. If G is a group and H is a subgroup of index 2 in G then prove that H is a normal subgroup of G.

SECTION - B

UNIT - IV

17. (G, \cdot) and (G^1, \cdot) be two groups $f: G \rightarrow G^1$ is an into homomorphism then prove
- (i) $f(e) = e^1$ (ii) $f(a^{-1}) = [f(a)]^{-1}$

Where e, e^1 are then identity elements in G and G^1 respectively.

18. State and prove fundamental theorem on Homomorphism of Groups.

UNIT - V

19. Examine the following permutation are even (or) odd

(i) $f = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 3 & 2 & 4 & 5 & 6 & 7 & 1 \end{pmatrix}$ (ii) $g = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 7 & 3 & 1 & 8 & 5 & 6 & 2 & 4 \end{pmatrix}$

20. Define cyclic group. Prove that every cyclic group is an abelian group.

1. 3 permut
2. 1 permut
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PAPER-III: WAVE OPTICS
(For Maths Combinations)
III SEMESTER

Work load:60 hrs per semester

4 hrs/week

UNIT-I (8 hrs)

1. Aberrations:

Introduction – monochromatic aberrations, spherical aberration, methods of minimizing spherical aberration, coma, astigmatism and curvature of field, distortion. Chromatic aberration-the achromatic doublet. Achromatism for two lenses (i)in contact and (ii) separated by a distance.

UNIT-II (14hrs)

2. Interference

Principle of superposition – coherence-temporal coherence and spatial coherence-conditions for interference of light.Fresnel's biprism-determination of wavelength of light –change of phase on reflection.Oblique incidence of a plane wave on a thin film due to reflected and transmitted light (cosine law) –colors of thin films-Interference by a film with two non-parallel reflecting surfaces (Wedge shaped film). Determination of diameter of wire, Newton's rings in reflected light. Michelson interferometer, Determination of wavelength of monochromatic light using Newton's rings and Michelson Interferometer.

UNIT-III (14hrs)

3. Diffraction

Introduction, distinction between Fresnel and Fraunhofer diffraction, Fraunhofer diffraction –Diffraction due to single slit-Fraunhofer diffraction due to double slit-Fraunhofer diffraction pattern with N slits (diffraction grating).Resolving power of grating, Determination of wavelength of light in normal incidence and minimum deviation methods using diffraction grating, Fresnel's half period zones-area of the half period zones-zone plate-comparison of zone plate with convex lens-difference between interference and diffraction.

UNIT-IV(10 hrs)

4.Polarisation:

Polarized light: methods of polarization polarization by reflection, refraction, double refraction, scattering of light-Brewster's law-Mauls law-Nicol prism polarizer and analyzer-Quarter wave plate, Half wave plate-optical activity, determination of specific rotation by Laurent's half shade polarimeter-Babinet's compensator - idea of elliptical and circular polarization

UNIT-V (14hrs)

5. Lasers and Holography

Lasers: introduction,spontaneous emission, stimulated emission. Population Inversion, Laser principle-Einstein coefficients-Types of lasers-He-Ne laser, Ruby laser-Applications of lasers.Holography: Basic principle of holography-Gabor hologram and its limitations, Applications of holography.

6. Fiber Optics

Introduction- different types of fibers, rays and modes in an optical fiber, fiber material,principles of fiber communication (qualitative treatment only), advantages of fiber optic communication.

REFERENCE BOOKS :

1. BSc Physics, Vol.2, Telugu Akademy, Hyderabad
2. A Text Book of Optics-N Subramanyam, L Brijlal, S.Chand& Co.
3. Unified Physics Vol.II Optics & Thermodynamics – Jai Prakash Nath&Co.Ltd., Meerut
4. Optics,F..A. Jenkins and H.G. White, Mc Graw-Hill
5. Optics, AjoyGhatak,Tata Mc Graw-Hill.
6. Introduction of Lasers – Avadhanulu, S.Chand& Co.
7. Principles of Optics- BK Mathur, Gopala Printing Press, 1995

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.
THREE YEAR B.Sc DEGREE EXAMINATION
SECOND YEAR EXAMINATION
SEMESTER-III :: SUB : PHYSICS (WITH MATHS) (PAPER-III)
MODEL PAPER

Time: 3 Hours

Max. Marks : 75

SECTION -A

Answer ALL the following Questions :
50Marks)

(5 X 10 =

1. (a) What is chromatic Aberration? Derive condition for achromatism when two lenses are put in contact.

(OR)

(b) What is spherical aloerration? Mention the different methods to minimize it.
2. (a) Describe the experimental arrangement of biprism to find the wave length of light.

(OR)

(b) Explain the principle, construction and working of Michelson Interferometer with a neat diagram.
3. (a) Describe fraun hoffer diffraction due to single slit illuminated by a single slit.

(OR)

(b) Explain the fraun hoffer diffraction due to double slit illuminated by monochromatic light.
4. (a) Describe the construction and working of a nicol prism mention its uses.

(OR)

(b) Define specific rotation. Describe the construction and working of laurents half-shade polarimeter.
5. (a) What is meant by population inversion. Explain the working of ruby laser.

(OR)

(b) Explain the gabor Hologram and mention its uses.

SECTION - B

Answer any THREE of the following questions :

(3 X 5 = 15

Marks)

6. Explain the defect coma and its minimization.
7. Write a short note an colours of thin film.
8. Explain resolving power of a grating.
9. State and explain law of malus.
10. What are the applications of lasers.

SECTION - C

Answer any TWO of the following questions :

(2 X 5 = 10

Marks)

11. Find the focal lengths of the two component lenses of an achromatic doublet of focal length 25 cm. The dispersive powers of the crown and flint glasses are 0.022 and 0.044 respectively.
12. In Newton's ring experiment, the diameters of the 4th and 12th dark rings are 0.4 cm and 0.7 cm respectively. Find the diameter of 20th dark ring.
13. Find the radii of the first circle on a zone plate behaving like a convert lens of focal length 100 cm ($\lambda = 5000 \text{ \AA}$).
14. A sugar solution of specific rotation 50 per decimeter per gm/cc causes a rotation of 10 cm. What is the concentration of the solution.
15. Calculate the thickness of a quarter wave plate made of quartz to be used with sodium light $\lambda = 6000 \text{ \AA}$, $\mu_o = 1.544$ and $\mu_e = 1.553$.

**Structure of Computer Science/Information Technology (IT) Syllabus II YEAR
III SEMESTER**

Paper-III : OBJECT ORIENTED PROGRAMMING USING JAVA

Course Objectives

As the business environment becomes more sophisticated, the software development (software engineering is about managing complexity) is becoming increasingly complex. As of the best programming paradigm which helps to eliminate complexity of large projects, Object Oriented Programming (OOP) has become the predominant technique for writing software in the past decade. Many other important software development techniques are based upon the fundamental ideas captured by object-oriented programming.

Course Outcomes

At the end of this course student will:

1. Understand the concept and underlying principles of Object-Oriented Programming
2. Understand how object-oriented concepts are incorporated into the Java programming language
3. Develop problem-solving and programming skills using OOP concept
4. Understand the benefits of a well structured program
5. Develop the ability to solve real-world problems through software development in high-level programming language like Java
6. Develop efficient Java applets and applications using OOP concept
7. Become familiar with the fundamentals and acquire programming skills in the Java language.

UNIT-1

FUNDAMENTALS OF OBJECT – ORIENTED PROGRAMMING :Introduction, Object Oriented paradigm, Basic Concepts of OOP, Benefits of OOP, Applications of OOP, Java features: **OVERVIEW OF JAVA LANGUAGE**: Introduction, Simple Java program structure, Java tokens, Java Statements, Implementing a Java Program, Java Virtual Machine, Command line arguments. **CONSTANTS, VARIABLES & DATA TYPES**: Introduction, Constants, Variables, Data Types, Declaration of Variables, Giving Value to Variables, Scope of variables, Symbolic Constants, Type casting, Getting Value of Variables, Standard Default values; **OPERATORS & EXPRESSIONS**.

UNIT-II

DECISION MAKING & BRANCHING: Introduction, Decision making with if statement, Simple if statement, if. Else statement, Nesting of if. else statements, the else if ladder, the switch statement, the conditional operator. **LOOPING**: Introduction, The While statement, the do-while statement, the for statement, Jumps in loops.

Structure of Computer Science/Information Technology (IT) Syllabus

CLASSES, OBJECTS & METHODS: Introduction, Defining a class, Adding variables, Adding methods, Creating objects, Accessing class members, Constructors, Method overloading, Static members, Nesting of methods;

UNIT-III

INHERITANCE: Extending a class, Overloading methods, Final variables and methods, Final classes, Abstract methods and classes;

ARRAYS, STRINGS AND VECTORS: Arrays, One-dimensional arrays, Creating an array, Two – dimensional arrays, Strings, Vectors, Wrapper classes;

INTERFACES: MULTIPLE INHERITANCE: Introduction, Defining interfaces, Extending interfaces, Implementing interfaces, Assessing interface variables;

UNIT-IV

MULTITHREADED PROGRAMMING: Introduction, Creating Threads, Extending the Threads, Stopping and Blocking a Thread, Lifecycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization, Implementing the 'Runnable' Interface. **MANAGING ERRORS AND EXCEPTIONS:** Types of errors : Compile-time errors, Run-time errors, Exceptions, Exception handling, Multiple Catch Statements, Using finally statement,

UNIT-V

APPLET PROGRAMMING: local and remote applets, Applets and Applications, Building Applet code, Applet Life cycle: Initialization state, Running state, Idle or stopped state, Dead state, Display state.

PACKAGES: Introduction, Java API Packages, Using System Packages, Naming conventions, Creating Packages, Accessing a Package, using a Package.

Reference Books:

1. E.Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw-Hill Company.
2. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series, TATA McGraw-Hill Company.
3. Deitel & Deitel. Java TM: How to Program, PHI (2007)
4. Java Programming: From Problem Analysis to Program Design- D.S Mallik
5. Object Oriented Programming Through Java by P. Radha Krishna, Universities Press (2008)

Student Activity:

1. Create a front end using JAVA for the student database created
 2. Learn the difference between ODBC and JDBC
-

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**CBCS – BSc(COMPUTER SCIENCE) - II YEAR - SEMESTER-III
OBJECT ORIENTED PROGRAMMING USING JAVA
MODEL QUESTION PAPER**

Time: 3 Hours

Max. Marks : 75

Section-A

Answer any FIVE of the following Questions:

(5 x 5= 25 Marks)

1. Explain about command line arguments.
2. Discuss about JVM.
3. Write about conditional operator
4. Define a class. How to define a class in Java.
5. Explain abstract methods.
6. What is an array? Discuss creating a one dimensional array in Java.
7. Write short notes on Thread
8. Discuss how to implement the Runnable Interface.
9. Differentiate local and remote applets.
10. Write about different Java API packages.

Section - B

Answer any FIVE of the following Questions

(5 × 10 =50 Marks)

11. Explain basic concepts of OOP.
12. Write about the structure of Java Program with an example.
13. Write in detail about looping structures in Java
14. Explain about constructors in Java.
15. Explain about Inheritance with an example.
16. Write about Interfaces used in Java
17. How to handle exceptions in Java with an example.
18. What is Thread? Explain thread life cycle.
19. Explain how to create user defined package.
20. Explain Applet life cycle in detail.

Instruction to Paper Setter:

Two questions must be given from each unit in Section-A and Section-B

Andhra Pradesh State Council of Higher Education
B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS
w.e.f.2015-2016 (Modified in April 2016)

**Structure of Computer Science/Information Technology (IT) Syllabus OBJECT
ORIENTED PROGRAMMING USING JAVA LAB**

1. Write a program to perform various String Operations
 2. Write a program on class and object in java
 3. Write a program to illustrate Function Overloading & Function Overriding methods in Java
 4. Write a program to illustrate the implementation of abstract class
 5. Write a program to implement Exception handling
 6. Write a program to create packages in Java
 7. Write a program on interface in java
 8. Write a program to Create Multiple Threads in Java
 9. Write a program to Write Applets to draw the various polygons
 10. Write a program which illustrates the implementation of multiple Inheritance using interfaces in Java
 11. Write a program to assign priorities to threads in java
-

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE

Foundation Course -7 SEMESTER-IV

COMMUNICATION SKILLS AND SOFT SKILLS-3 (CSS -3)

Common for BA/BCom/BSc/BBA/BCA Programmes

COURSE CONTENT (30 hours)

Unit – I

SOFT SKILLS

- I. Positive Attitude
- II. Body language
- III. SWOT / SWOC Analysis
- IV. Emotional Intelligence
- V. Netiquette

Unit - II

PARAGRAPH WRITING

1. Paragraph Structure
2. Development of Ideas

Unit –III

PARAPHRASING AND SUMMARISING

1. Elements of Effective Paraphrasing
2. Techniques of Paraphrasing
3. What makes a Good Summary
4. Stages of Summarising

Unit – IV

LETTER WRITING

1. Letter Writing (Formal and Informal)
2. E-Correspondence

Unit – V

RESUME AND CV

1. Resume and Curriculum Vitae
2. Cover Letters

* * *

Reference Books:

Commissionerate of Collegiate Education, Government of Andhra Pradesh (2015)

JKC -Communication Skills and Soft Skills: Student's Book

Sethi, J., and P.V. Dhamija (1999) *A Course in Phonetics and Spoken English*

New Delhi: Prentice-Hall of India

Daniel Jones (2011) *English Pronouncing Dictionary* (18th Edition) Ed. Peter Roach, Jane Setter, and John Esling

Quirk, Randolph and Sydney Greenbaum (1973) *A University Grammar of English*. Harlow: Longman. Chapters 2, 3, and 7

White, Goodith (2010) *Listening (Resource Book for Teachers)*. Oxford University Press Nageshwar

Rao and Rajendra P. Das (2009) *Communication Skills*. Mumbai: Himalaya Publishing House

Burton, S.H. (1983) *Mastering English Language*. The Macmillan Press Limited Chapter 3: Comprehension

Grellet, Françoise (2007) *Developing Reading Skills*. Cambridge University Press

Roberts, Rachael, Joanne Gakonga, and Andrew Preshous (2004) *IELTS Foundation: Student's Book*. Oxford: Macmillan Education

Roberts, Rachael, Joanne Gakonga, and Andrew Preshous (2004) *IELTS Foundation: Study Skills*. Oxford: Macmillan Education.

VIKRAMA SIMHAPURI UNIVERSITY :: KAKUTUR

COMMUNICATION AND SOFT SKILLS (CSS) - 3

(Common to SECOND YEAR - FOURTH SEMESTER B.A., B.A (O.L) B.Com., B.Sc.,BCA,BBA)
(A. P. Common Core Syllabus (CBCS) for I year Effective from 2015-16) (Revised in May 2016)

Model Question Paper (2017-18)

Time: 2 Hours

Max. Marks: 50

1. Answer any ***TWO*** of the following questions. 2 X 5 = 10

1. Write a few suggestions for building positive attitude.
2. Mention a few tips for improving one's good body language.
3. What is SWOT/ SWOC analysis? Why is it useful for students?
4. What is emotional intelligence? What is its importance?
5. What do you know about Netiquette? Write a few general netiquettes.

2. Answer any ***TWO*** of the following questions. 2 X 5 = 10

1. What is a paragraph? Write about the types of paragraphs.
2. What are the general rules for writing a good paragraph?
3. Write a paragraph on a Rainy Day.
4. Write a paragraph on Death Penalty for Criminals
5. Write about the parts of a good paragraph.

3. Answer any ***TWO*** of the following questions. 2 X 5 = 10

1. What is paraphrasing? What are features of a paraphrase?
2. Write a few guidelines for paraphrasing.
3. Write about good summary.
4. Write a short note on stages of summarizing.
5. Write a summary of the story given below.

There was a villager. He was illiterate. He did not know how to read and write. He often saw people wearing spectacles for reading books or papers. He thought, "If I have spectacles, I can also read like these people. I must go to town and buy a pair of spectacles for myself." So one day he went to a town. He entered a spectacles shop He asked the shopkeeper for a pair of spectacles for reading. The shopkeeper gave him various pairs of spectacles and a book. The villager tried all the spectacles one by one. But he could not read anything. He told the shopkeeper that all those spectacles were useless for him. The shopkeeper gave him a doubtful look. Then he looked at the book. It was upside down! The shopkeeper said, "Perhaps you don't know how to read." The villager said, "No, I don't. I want to buy spectacles so that I can read like others. But I can't read with any of these spectacles." The shopkeeper controlled his laughter with great difficulty when he learnt the real problem of his illiterate customer. He explained to the villager, "My dear friend, you are very ignorant. Spectacles don't help to read or write. They only help you to see better. First of all you must learn to read and write."

4. Answer any ***TWO*** of the following questions. 2 X 5 = 10

1. Write a letter to the MRO requesting him/her for the issue of Income Certificate.
2. Write a letter to your father asking him to send you money for paying your hostel fee.
3. Write a letter to a bookshop ordering the books you want.
4. One of your friends has recently left for the USA for doing MS. You miss him very much.
5. Write an e-mail to your friend Ravi.
- 6.

5. Answer any ***TWO*** of the following questions. 2 X 5 = 10

1. Prepare Resume of your own for the post of accountant in a reputed company.
2. Prepare a resume for the post of computer operator in a Public School.
3. Write a covering letter to accompany your Resume for the post of accountant.
4. Write a covering letter to accompany your Resume for the post of computer operator.

* * *

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.

Foundation Course - 8

ANALYTICAL SKILLS

Syllabus, For all Degree Programmes.

w.e.f. 2015-16 (Revised in April, 2016)

Semester – IV

(Total 30 Hrs)

UNIT – 1

Data Analysis:-The data given in a Table, Graph, Bar Diagram, Pie Chart.

UNIT – 2

Sequence and Series:- Analogies of numbers and alphabets completion of blank spaces following the pattern in A:b::C: d relationship odd thing out; Missing number in a sequence or a series.

UNIT - 3

Arithmetic ability:-Algebraic operations BODMAS, Fractions, Divisibility rules, LCM&GCD (HCF).

UNIT - 4

Quantitative aptitude:- Calendar Problems, Clock Problems, Ratios and proportion.

UNIT – 5

Business computations:- Averages, Percentages, Profit & Loss.

Reference Books:

1. Quantitative Aptitude for Competitive Examination by R S Agrawal, S.Chand publications.
2. Quantitative Aptitude and Reasoning by R V Praveen, PHI publishers.
3. Quantitative Aptitude : Numerical Ability (Fully Solved) Objective Questions, Kiran Prakashan, Pratogitaprakasan, Kic X, Kiran Prakasan publishers
4. Quantitative Aptitude for Competitive Examination by Abhijit Guha, Tata Mc Graw hill publications.
5. Old question Paper of the exams conducted by (Wipro, TCS, Infosys, Etc) at their recruitment process, source-Internet.

Note : The teachers/students are expected to teach /learn the contents by not converting them to the problems of algebra at the maximum possible extent, but to use analytical thinking to solve the exercises related to those topics. This is the main aim of the course.

1. S. Praveen
2. ~~PHI~~
3. U. C. Prakashan
4. Kiran
5. Wipro etc

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.
FOUNDATION COURSE-8
SEMESTER-IV
ANALYTICAL SKILLS
Model Question Paper

Time : 2 Hours

Answer any 25 Questions. All question carry equal marks.

Max. Marks : 50

25 X 2 = 50M

UNIT-I

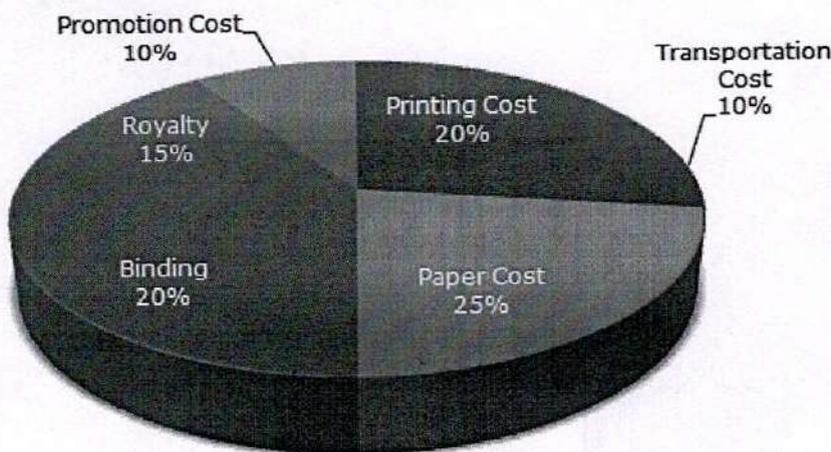
Study the following table and answer the question based on it.

Expenditures of company (in Lakh Rupees) per annum over the given year.

| Year | Item of Expenditure | | | | |
|------|---------------------|------|-------|----------|-------|
| | Salary | Fuel | Bonus | Interest | Taxes |
| 1998 | 288 | 98 | 3.00 | 23.4 | 83 |
| 1999 | 342 | 112 | 2.52 | 32.5 | 108 |
| 2000 | 324 | 101 | 3.84 | 41.6 | 74 |
| 2001 | 336 | 133 | 3.68 | 36.4 | 88 |
| 2002 | 420 | 142 | 3.96 | 49.4 | 98 |

- What is the average amount of interest per year company had to pay?
 A) 32.43 Lakhs B) 33.72 Lakhs
 C) 34.18 Lakhs D) 36.66 Laksh
- The total amount of bonus during these period is approximately what percent of the total salary during the period
 A) 0.1% B) 0.5% C) 1% D) 1.25%
- Total expenditure on all these items in 1998 was approximately what percent of total expenditure in 2002
 A) 62% B) 66% C) 69% D) 71%
- Total expenditure of the company over these items during 2000 is?
 A) 544.44 Lakhs B) 501.11 Lakshs C) 446.46 Lakhs D) 478.87 Lakhs
- The ratio between total expenditure on taxes of all years and total expenditure on fuel respectively?
 A) 4:7 B) 10:13 C) 15:18 D) 5:8

Study the following Pi-Chart and answer the following questions
 Various expenditures (in percentage) incurred in publishing a book



1. 30%
 2. 10%
 3. 10%
 4. 15%
 5-7% etc

6. If for a certain quantity of books the publisher has to pay Rs 30600 as printing cost then what will be the amount of royalty?
 A) Rs19,450 B) Rs21,200 C) Rs22,950 D) Rs26,150
7. What is the central angle of the section corresponding to the expenditure of Royalty?
 A) 150° B) 24° C) 54° D) 48°
8. What is difference of cost for paper and binding in percentages?
 A 5% B) 10% C) 15% D) 20%
9. If 5500 copies are published and the transportation cost on them is 82500, then what should be the selling price of book so that publisher earn 25% profit
 A) Rs 187.50 B) Rs 191.50 C) Rs175 D) Rs180
10. Royalty on the book is less than the printing cost by
 A) 5% B) 331% C) 20% D) 25%

UNIT-II

Complete the following Series

11. 125,80,45,20, _____
 A) 5 B) 15 C) 25 D) 35
12. 6,12,18,24 _____
 A) 30 B) 26 C) 28 D) 29
13. 20,40,60,80 _____
 A) 90 B) 85 C) 100 D) 110
14. T,R,P,N _____
 A) M B) L C) O D) S
15. GH, JK, MN, PQ _____
 A) MP B) ST C) TR D) RT
16. 2B, 4C, 6E, 8H _____
 A) 10 L B) 9 P C) 8 F D) 13M
17. D-4, F-6, H-8, J-10 _____
 A) Z-1 B) N-10 C) M-16 D) L-12
18. Find the odd one 3,5,7,9,11,13
 A) 3 B) 9 C) 7 D) 13
19. Girl : Beautiful :: Boy : ?
 A) Smart B) Handsome C) Heroic D) Pretty
20. Victory: Encouragement :: failure?
 A) Sadness B) Defeat C) Anger D) Frustration

1. 300000
 2. ~~100000~~
 3. 11. 100000
 4. 100000
 5-70000

UNIT-III

21. $15 \div 3 \times 1 \div 5 =$ _____
A) 1 B) 2 C) 3 D) 4
22. $\frac{3}{4}$ OF $12+9=$ _____
A) 21 B) 22 C) 18 D) 20
23. $(6+4) \times 5 + 14 =$ _____
A) 50 B) 64 C) 30 D) 56
24. What is the value of $\frac{3}{4}$ in 1600?
A) 1000 B) 1100 C) 1200 D) 1300
25. What is the result of $\frac{\frac{2}{3} \times \frac{3}{4}}{\frac{2}{4} \times \frac{8}{2}}$?
A) 1 B) 2 C) 3 D) $\frac{1}{4}$
26. 4082A0 is divisible by 4 then A is ?
A) 1 B) 2 C) 3 D) 5
27. Sum Of 10 Natural Numbers Is
A. 65 B. 35 C. 45 D. 55
28. Find The Hcf Of 3556 And 3444 Is?
A. 23 B. 25 C. 26 D. 28
29. Find The L.C.M Of 16, 24, 36, 54?
A. 432 B. 324 C. 243 D. 24
30. Find the Highest Common Fraction Of 36 & 84
A. 8 B. 12 C. 14 D. 24

UNIT-IV

31. What Was the Day India Attained Independence (1947-Aug-15)
A. Friday B. Saturday C. Monday D. Sunday
32. 1869-Oct-2 Was What Day?
A. Friday B. Saturday C. Monday D. Sunday
33. ----- Is Leap Year?
A. 1996 B. 1997 C. 1998 D. 1999
34. How Many Times the Two Hands Co-Inside in A Day
A. 21 B. 22 C. 23 D. 24
35. When Do the Two Hands of a Clock Co-Inside between 9 and 10'clock
A. 8.45 B. 9.50 C. $9.49\frac{1}{11}$ D. $9.59\frac{1}{11}$
36. Between 5 P.M And 6 P.M When Will the Two Hands Of The Clock Be At Right Angle?
A. $5:10\frac{10}{11}$ B. $5:43\frac{7}{11}$ C. 5:10 D. 5:42

1. 3 p.m. to 4 p.m.
2. ~~4 p.m. to 5 p.m.~~
3. 11. 00 a.m.
4. 8.15 a.m.
5-7.10 a.m.

37. A Particular Sum Was Divided Among A, B and C in the Ratio 2: 6: 7 Respectively. If The Amount Received By A Was 4000 Then Total Amount
 A.30000 B.20000 C.25000 D.29000
38. Divided 672 In The Ratio 5: 3 Then The First Part (5) Value?
 A. 420 B.252 C. 410 D. 240
39. If $0.75 : X :: 5 : 8$ Then : X Is -----
 A. $\frac{6}{5}$ B. $\frac{5}{6}$ C. $\frac{7}{5}$ D. $\frac{5}{7}$
40. $4 : 9 : 12 : X ?$ -----
 A. 27 B. 27 C. 29 D. 30

UNIT-V

41. Find the Average Of All Prime Numbers Between 30 And 50?
 A. 35 B.39.8 C.40.2 D .41.4
42. Find the Average Of First Five Natural Numbers
 A. 15 B.20 C. 16 D.18
43. Average Of 76, 65, 82, 67, 85 Is
 A. 65 B.69 C.75 D. 76
44. X And Y Are Two Values Then Is The Percentage Of X In Y
 A. $\frac{x}{y} \times 100$ B. $\frac{y}{x} \times 100$ C. $x \times 100$ D. $y \times 100$
45. What Is The Value (80% Of 400)+ (30% Of 200)
 A. 380 B.390 C.4850 D.4880
46. 4598 Is 95% Of -----?
 A. 4800 B.4840 C.4850 D.4880
47. Cost Prize Is X, Selling Prize Is Y ($Y > X$) Then What Is the Profit Percentage
 A. $\frac{y-x}{x} \times 100$ B. $\frac{x-y}{y} \times 100$ C. $\frac{x}{y} \times 100$ D. $\frac{y}{x} \times 100$
48. Find The Cost Prize When Selling Prize Is 40 And Gain Percentage 33.33
 A.30 B.35 C.40 D.45
49. If the Cost Price of 12 Pens Equal To The Selling Price Of 8 Pens The Gain Percentage Is?
 A.50% B.70% C.60% D.80%
50. Some Articles Were Bought For 5000 And Sell for 4500 Then Loss Percentage
 A.10% B.20% C.30% D.40%

1. 3 pen
 2. ~~4 pen~~
 3. 11. 10000
 4. 10000
 5-711 de

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.
THREE YEAR (CBCS) DEGREE EXAMINATION
(FOR BA/BSC/BCOM/BBA COURSES)
FOUNDATION COURSE - 9
ENTREPRENEURSHIP
SYLLABUS

SEMESTER – IV

(Total 30 Hrs)

Unit-I: Entrepreneurship: Entrepreneur characteristics – Classification of Entrepreneurships – Incorporation of Business – Forms of Business organizations –Role of Entrepreneurship in economic development –Start-ups.

Unit-II: Idea Generation and Opportunity Assessment: Ideas in Entrepreneurships – Sources of New Ideas – Techniques for generating ideas – Opportunity Recognition – Steps in tapping opportunities.

Unit-III: Project Formulation and Appraisal : Preparation of Project Report –Content; Guidelines for Report preparation – Project Appraisal techniques –economic – Steps Analysis; Financial Analysis; Market Analysis; Technical Feasibility.

UNIT-IV: Institutions Supporting Small Business Enterprises: Central level Institutions: NABARD; SIDBI, NIC, KVIC; SIDIO; NSIC Ltd; etc. – state level Institutions –DICs-SFC- SSIDC- Other financial assistance.

Unit-V: Government Policy and Taxation Benefits: Government Policy for SSIs- tax Incentives and Concessions –Non-tax Concessions –Rehabilitation and Investment Allowances.

Reference Books:

1. Arya Kumar, Entrepreneurship, Pearson, Delhi, 2012.
2. Poornima M.CH., Entrepreneurship Development –Small Business Enterprises, Pearson, Delhi,2009
3. Michael H. Morris, ET. al., Entrepreneurship and Innovation, Cen gage Learning, New Delhi, 2011
4. KanishkaBedi, Management and Entrepreneurship, Oxford University Press, Delhi, 2009
5. Anil Kumar, S., ET.al., Entrepreneurship Development, New Age International Publishers, New Delhi, 2011
6. Khanka, SS, Entrepreneurship Development, S. Chand, New Delhi.
7. Peter F. Drucker, Innovation and Entrepreneurship.
8. A.Sahay, M. S. Chhikara, New Vistas of Entrepreneurship: Challenges & Opportunities.

Instruction to Paper Setter :

TWO Questions must be given from each Unit.

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.
THREE YEAR (CBCS) DEGREE EXAMINATION
(FOUNDATION COURSE)
SECOND YEAR EXAMINATION
SEMESTER - IV
ENTREPRENEURSHIP
MODEL PAPER

Time: 2 Hours

Max. Marks : 50

I. Answer Any FIVE of the Following: -

5 X 10 = 50

1. Explain the characteristics of Entrepreneur?
ఎంప్రెన్ప్రీన్యూర్ యొక్క లక్షణాలను వివరించండి?
2. Explain forms of business organizations?
వ్యాపార సంస్థలలో రకాలను గురించి వ్రాయండి?
3. Explain Sources of new ideas?
క్రొత్త ఆలోచనలకు మూలాలను వివరించండి?
4. Selecting the techniques for generating Ideas?
క్రొత్త ఆలోచనలను ఎంచుకొనే పద్ధతులను గురించి వ్రాయండి?
5. Explain Elements of Project Report?
ప్రాజెక్టు నివేదిక అంశాలను వ్రాయండి?
6. Write about Project appraisal Techniques?
ప్రాజెక్టు సమీక్ష విధానాలను వివరించండి?
7. Write about NABARD?
నాబార్డ్‌ను వివరించండి?
8. Explain SFC's?
రాష్ట్రస్థాయి విత్తసంస్థలు గురించి వ్రాయండి?
9. Explain Role of SSIs?
చిన్నతరహాపరిశ్రమలు ప్రాముఖ్యతను వ్రాయండి?
10. Explain Tax incentives and concessions?
చిన్నతరహాపరిశ్రమకు పన్నులపాలసీలు మరియు ప్రయోజనాలు గురించి వివరించండి?

Instruction to Paper Setter :

TWO Questions must be given from each Unit.

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE

Foundation Course - 10

SECOND YEAR – SEMESTER - IV

LEADERSHIP EDUCATION

(Common for BA/BCOM/BSC/BBA)

SYLLABUS

(Total 30 Hrs)

1. Organisation – Management – Leadership – Meaning and Significance – Different theories – Trait Theory, Blake & Mountan Theory – Other functions of Management.
2. Behavioral Concepts – Individual Behaviour – Perception – Learning – Attitude Formation and Change – Motivation – Theories of Motivation – Personality Development.
3. Interpersonal Behaviour – Communication – Leadership – Influencing Relations – Transactional Analysis.
4. Team Building and Management – Developing team resources – Designing team – Participation and Repercussion – Team building activities.

Reference Books :

1. Fred Luthans, “Organizational Behaviour”, Tata McGraw Hill Publishing Co., New Delhi.
2. Robins, Stephen P, “Organisational Behaviour”, 9th Edition, Prentice Hall of India, New Delhi.
3. Koontz and O “Donnell”, Essentials of Management, Tata McGraw Hill Publishing Co., New Delhi, 2000.
4. Keith Davis, “Human Behaviour at Work”, Tata McGraw Hill Publishing Co., New Delhi.
5. Aswathappa, ”Orgnizational Behaviour”, Himalaya Publishing House, Mumbai
6. Stoner Freeman, “Management”, Prentice Hall of India, New Delhi.

Instruction to Paper Setter :

TWO Questions must be given from each concepts.

3

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.
THREE YEAR (CBCS) DEGREE EXAMINATION
(FOUNDATION COURSE)
SECOND YEAR EXAMINATION
SEMESTER - IV
LEADERSHIP EDUCATION
MODEL PAPER

Time: 2 Hours

Max. Marks : 50

I. Answer Any FIVE of the Following: -

5 X 10 = 50

1. Explain the functions of Management.
నిర్వహణ విధులను వివరింపుము?
2. Explain the theory's of Leadership.
నాయకత్వ సిద్ధాంతాలు గూర్చి వివరింపుము?
3. Write the process of Perception.
గ్రహణశక్తి ప్రక్రియను వివరింపుము?
4. Explain the concept of Attitude.
విలువలు మరియు వైఖరులను వివరించండి?
5. Explain the theories of Motivation.
ప్రేరణసిద్ధాంతాలు గూర్చి వివరింపుము?
6. Explain the process of communication.
కమ్యూనికేషన్ విధానమును వివరింపుము?
7. Explain Transactional Analysis.
సమర్థవంతమైన నాయకత్వాన్ని వివరించండి?
8. Explain the Team Building Activities.
వివిధ రకాల జట్టు నిర్మాణ కార్యకలాపాలను వివరించండి?
9. Explain the Concept of team Building.
జట్టు నిర్మాణం గూర్చి వివరింపుము?
10. Explain the importance of leadership.
నాయకత్వము యొక్క ప్రాముఖ్యతను వివరింపుము?

Instruction to Paper Setter :

Minimum TWO Questions must be given from each concepts.

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE

(w.e.f. 2016-17)

B.A./B.Sc. (CBCS) MATHEMATICS SYLLABUS

SECOND YEAR SEMESTER – IV

REAL ANALYSIS

60 Hrs

UNIT – I (12 hrs) : REAL NUMBERS :

The algebraic and order properties of \mathbb{R} , Absolute value and Real line, Completeness property of \mathbb{R} , Applications of supreme property; intervals. No. Question is to be set from this portion.

Real Sequences: Sequences and their limits, Range and Boundedness of Sequences, Limit of a sequence and Convergent sequence, Monotone sequences, Necessary and Sufficient condition for Convergence of Monotone Sequence, Limit and the Bolzano-weierstrass theorem – (Cauchy Sequences – Cauchy's general principle of convergence theorem) No. Question is to be set from this portion.

Series : Introduction to series, convergence of series of Non-Negative Terms.

1. P-test
2. Cauchy's n^{th} root test or Root Test.
3. D'Alembert's Test or Ratio Test.

UNIT – II (12 hrs) : CONTINUITY :

Limits : Real valued Functions, Boundedness of a function, Limits of functions. Some extensions of the limit concept, Infinite Limits. Limits at infinity. No. Question is to be set from this portion.

Continuous functions : Continuous functions, Combinations of continuous functions, Continuous Functions on intervals.

UNIT – III (12 hrs) : DIFFERENTIATION :

The derivability of a function, on an interval, at a point, Derivability and continuity of a function, Graphical meaning of the Derivative, Problems on Differentiation.

UNIT – IV (12 hrs) : MEAN VALUE THEOREMS :

Mean value Theorems; Rolle's Theorem, Lagrange's Theorem, Cauchy's Mean value Theorem Statement and their Applications.

UNIT – V (12 hrs) : RIEMANN INTEGRATION :

Riemann Integral, Riemann integral functions. Necessary and sufficient condition for R-integrability, Properties of Integrable functions, Continuous Functions R-Integral, Monotonic Function R-Integrable constant function R-Intergrable - Fundamental theorem of integral calculus.

Prescribed Text Book :

1. A Text Book of B.Sc Mathematics by B.V.S.S. Sarma and others, Published by S. Chand & Company Pvt. Ltd., New Delhi.

Reference Books :

1. Real Analysis by Rabert & Bartely and .D.R. Sherbart, Published by John Wiley.
2. Elements of Real Analysis as per UGC Syllabus by Shanthi Narayan and Dr. M.D. Raisingania Published by S. Chand & Company Pvt. Ltd., New Delhi.
3. Telugu Academy Text Book for Real Analysis.
4. I-B.Sc A text Book of a Mathematics Deepthi Publications.

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on Real Analysis and its applications

1. S. Sarma
2. ~~...~~
3. U. Chandra
4. Shanti
5-710 de

**BLUE PRINT OF QUESTION PAPER
(INSTRUCTIONS TO PAPER SETTER)
B.A./B.Sc. MATHEMATICS SEMESTER-IV
(REAL ANALYSIS)**

NOTE :- Paper Setter Must select TWO Short Questions and TWO Easy Questions from Each Unit as Follows :-

| PAPER | TOPICS | 5 MARKS QUESTIONS | 10 MARKS QUESTIONS |
|------------|---------------------|-------------------|--------------------|
| UNIT - I | Sequence | 1 (Prb) | 1 (Th) |
| | Series | 1 (Prb) | 1 (Th) |
| UNIT - II | Continuity | 2 (Prb) | 1(Prb) + 1 (Th) |
| UNIT - III | Differentiation | 2 (Prb) | 2 (Prb) |
| UNIT - IV | Mean Value Theorems | 1(Prb) + 1 (Th) | 1(Prb) + 1 (Th) |
| UNIT - V | Riemann Integration | 1(Prb) + 1 (Th) | 2(Th) |

1. 3 questions
2. ~~1~~
3. 11. cl. exam
4. 8 lines
5-77A de

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE

(w.e.f. 2016-17)

B.A./B.Sc. SECOND YEAR MATHEMATICS

SEMESTER - IV

MODEL QUESTION PAPER

(REAL ANALYSIS)

Time: 3 Hours

Max. Marks : 75

PART - A

I. Answer any FIVE of the following Questions :

(5 X 5= 25 Marks)

1. Test for convergence $\sum \frac{1}{n^2 + 1}$.
2. Prove that the sequence $\{s_n\}$ where $s_n = \frac{1}{n+1} + \frac{1}{n+2} + \dots + \frac{1}{n+n}$ is convergent.
3. Discuss various types of discontinuity.
4. Examine for continuity of a function $f(x) = |x| + |x-1|$ at $x=0$.
5. If $f(x) = \frac{x}{1+e^x}$ if $x \neq 0$ and $f(x) = 0$ if $x=0$ show that f is not derivable at $x = 0$.
6. Prove that $f(x) = x^2 \sin\left(\frac{1}{x}\right)$, $x \neq 0$ and $f(0) = 0$ is derivable at the origin.
7. State cauchy's Mean value theorem.
8. Find 'C' of the Lagrange's mean value theorem for $f(x) = (x-1)(x-2)(x-3)$ on $[0, 4]$.
9. If $f(x) = x^2$ on $[0, 1]$ and $P = \left\{0, \frac{1}{4}, \frac{2}{4}, \frac{3}{4}, 1\right\}$ compute $L(P, f)$ and $U(P, f)$.
10. Prove that a constant function is Reiman integrable on $[a, b]$.

PART - B

II. Answer any FIVE of the following Questions.

Choosing at least ONE Question from Each Section.

(5 × 10 = 50 Marks)

SECTION - A

UNIT - I

- 11. State and prove Bolzano-weierstrass theorem on sequence.
- 12. State and prove P-test.

UNIT - II

- 13. Discuss the continuity of $f(x) = \frac{x \begin{pmatrix} \frac{1}{e^x - e} & -\frac{1}{x} \end{pmatrix}}{\frac{1}{e^x + e} & -\frac{1}{x}}$ for $x \neq 0$ and $f(0) = 0$ at $x = 0$.
- 14. If f is continuous on $[a, b]$ and $f(a), f(b)$ having opposite signs then prove that there exist $C \in (a, b) \ni f(C) = 0$.

UNIT - III

- 15. Show that $f(x) = x \sin\left(\frac{1}{x}\right), x \neq 0, f(x) = 0$ when $x=0$ is continuous but not derivable at $x=0$.

- 16. Show that $f(x) = \frac{x \begin{pmatrix} \frac{1}{e^x - 1} \end{pmatrix}}{\frac{1}{e^x + 1}}$ if $x \neq 0$ and $f(0) = 0$ is continuous at $x=0$ but not derivable at $x=0$.

SECTION - B

UNIT - IV

- 17. State and prove Rolle's theorem.
- 18. Using Lagrange's theorem show that $x > \log(1+x) > \frac{x}{1+x}$ if $f(x) = \log(1+x)$.

UNIT - V

- 19. If $f : [a, b] \rightarrow R$ is monotonic on $[a, b]$ then f is integrable on $[a, b]$.
- 20. If $f \in R[a, b]$ and m, M are the infimum and supremum of f on $[a, b]$, then

$$m(b-a) \leq \int_a^b f(x) dx \leq M(b-a).$$

1. 3
2. 1
3. 11
4. 11
5-11

Work load: 60 hrs per semester

4 hrs/week

UNIT-I (10 hrs)

1. Kinetic theory of gases

Introduction –Deduction of Maxwell's law of distribution of molecular speeds, experimental verification. Transport phenomena – Mean free path - Viscosity of gases-thermal conductivity-diffusion of gases.

UNIT-II(12 hrs)

2. Thermodynamics

Introduction- Isothermal and adiabatic process- Reversible and irreversible processes- Carnot's engine and its efficiency-Carnot's theorem-Second law of thermodynamics. Kelvin's and Clausius statements-Entropy, physical significance –Change in entropy in reversible and irreversible processes-Entropy and disorder-Entropy of Universe– Temperature-Entropy (T-S) diagram and its uses - Change of entropy of a perfect gas-change of entropy when ice changes into steam.

UNIT-III(12 hrs)

3. Thermodynamic potentials and Maxwell's equations

Thermodynamic potentials-Derivation of Maxwell's thermodynamic relations-Clausius-Clayperon's equation-Derivation for ratio of specific heats-Derivation for difference of two specific heats for perfect gas.Joule Kelvin effect-expression for Joule Kelvin coefficient for perfect and vander Waal's gas.

UNIT-IV(12 hrs)

4. Low temperature Physics

Introduction-Joule Kelvin effect-Porous plug experiment - Joule expansion-Distinction between adiabatic and Joule Thomson expansion-Expression for Joule Thomson cooling-Liquefaction of helium, Kapitza's method-Adiabatic demagnetization, Production of low temperatures -applications of substances at lowtemperature-effects of chloro and fluoro carbons on ozone layer.

UNIT-V(14 hrs)

5. Quantum theory of radiation

Blackbody-Ferry's black body-distribution of energy in the spectrum of black body-Wein's displacement law, Wein's law, Rayleigh-Jean's law-Quantum theory of radiation-Planck's law-Measurement of radiation-Types of pyrometers-Disappearing filament optical pyrometer-experimental determination – Angstrompyrheliometer-determination of solar constant, Temperature of Sun.

REFERENCE BOOKS:

1. BSc Physics, Vol.2, Telugu Akademy, Hyderabad
2. Thermodynamics, R.C.Srivastava, S.K.Saha& Abhay K.Jain, Eastern Economy Edition.
3. Unified Physics Vol.2, Optics & Thermodynamics, Jai Prakash Nath&Co.Ltd., Meerut
4. Fundamentals of Physics. Halliday/Resnick/Walker.C. Wiley India Edition 2007
5. Heat, Thermodynamics and Statistical Physics-N Brij Lal, P Subrahmanyam, PS Hemne, S.Chand& Co.,2012
6. Heat and Thermodynamics- MS Yadav, Anmol Publications Pvt. Ltd, 2000
7. University Physics, HD Young, MW Zemansky,FW Sears, Narosa Publishers, New Delhi

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE
PHYSICS

Paper IV: Thermodynamics & Radiation Physics
(With Maths Combination)
II-YEAR – SEMESTER-IV
MODEL QUESTION PAPER

Time: 3 hours

Max.Marks:75

SECTION-A

ANSWER ALL QUESTIONS

5 X 10 = 50 M

1. (a) Derive an expression for maxwell's law of distribution of molecular speeds in a gas.
(OR)
(b) State the viscosity of a gas and explain it an the basis of kinetic theory.
2. (a) Describe the working of carnot's engine and derive an expression for its efficiency.
(OR)
(b) What are reversible and irreversible process?
3. (a) What is joule-kelvin effect? Describe the porous plug experiment and indicate the result.
(OR)
(b) Define four thermodynamic potentials. Obtain maxwell's thermodynamic equations using these potentials.
4. (a) What is adiabatic demagnetization? How this principle is used in producing low temperatures.
(OR)
(b) What is joule-thomson effect? Obtain an expression for cooling produced when a gas suffers joule – Thomson effect.
5. (a) What are basic concepts of Planck's quantum theory? Derive Planck's law of black body radiation.
(OR)
(b) Derive an expression for energy distribution in reyleigh-jeans formula.

SECTION-B

ANSWER ANY THREE QUESTIONS

3 X 5 = 15M

6. Explain transport phenomena with reference to a gas.
7. Write a short note on entropy of universe.
8. Explain clausius – clapeyron equation.
9. Explain briefly the principle and working of a refrigerator.
10. Define solar constant. How is it determined.

SECTION-C

ANSWER ANY TWO QUESTIONS

2 X 5 = 10M

11. Calculate the value of r.m.s. speed for hydrogen molecule at 5000k
($R = 1.38 \times 10^{-23} J / K$)
12. Calculate the work done when a gram mole of a perfect gas expands isothermally at $27^{\circ}C$ to double its original volume.
13. Prove the thermodynamic relation $Tds = CvdT + T \left(\frac{\partial P}{\partial T} \right)_v dv$.
14. Calculate the temperature of inversion of helium gas. Given and $a = 3.44 \times 10^{-3} nt - m^4 / mol^2$ and $b = 0.0237 \times 10^{-3} m^3 / mol$ and $R = 8.31 J / mol - K$.
15. Using wien's displacement law, estimate the temperature of sun.
($\lambda m = 4900 A^{\circ}$, wien's constant = 0292 cm k)

Andhra Pradesh State Council of Higher Education
B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS
w.e.f.2015-2016 (Modified in April 2016)

Structure of Computer Science/Information Technology (IT) Syllabus II YEAR IV SEMESTER

Paper-IV: DATA STRUCTURES

Course Objectives

To introduce the fundamental concept of data structures and to emphasize the importance of data structures in developing and implementing efficient algorithms..

Course Outcomes

After completing this course satisfactorily, a student will be able to:

1. Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms
2. Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs.
3. Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs
4. Demonstrate different methods for traversing trees
5. Compare alternative implementations of data structures with respect to performance
6. Compare and contrast the benefits of dynamic and static data structures implementations
7. Describe the concept of recursion, give examples of its use, describe how it can be implemented using a stack .
8. Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.

UNIT I

Concept of Abstract Data Types (ADTs)- Data Types, Data Structures, Storage Structures, and File Structures, Primitive and Non-primitive Data Structures, Linear and Non-linear Data Structures.

Linear Lists – ADT, Array and Linked representations, Pointers.

Arrays – ADT, Mappings, Representations, Sparse Matrices Linked Lists: Single Linked List, Double Linked List, Circular Linked List , applications

UNIT II

Stacks: Definition, ADT, Array and Linked representations, Implementations and Applications

Queues: Definition, ADT, Array and Linked representations, Circular Queues, Dequeues, Priority Queues, Implementations and Applications.

UNIT III

Trees: Binary Tree, Definition, Properties, ADT, Array and Linked representations, Implementations and Applications. Binary Search Trees (BST) – Definition, ADT, Operations and Implementations,

Structure of Computer Science/Information Technology (IT) Syllabus

UNIT IV

Graphs – Graph and its Representation, Graph Traversals, Connected Components, Basic Searching Techniques, Minimal Spanning Trees

UNIT- V

Sorting and Searching: Selection, Insertion, Bubble, Merge, Quick, sort, Sequential and Binary Searching.

REFERENCE BOOKS

1. D S Malik, Data Structures Using C++, Thomson, India Edition 2006.
2. Sahni S, Data Structures, Algorithms and Applications in C++, McGraw-Hill, 2002.
3. SamantaD, Classic Data Structures, Prentice-Hall of India, 2001.
4. Heilman G I,. Data Structures and Algorithms with Object-Oriented Programming, Tata McGraw-Hill. 2002. (Chapters I and 14).
5. Tremblay P, and Sorenson P G, Introduction to Data Structures with Applications, Tata McGraw-Hill,

Student activity:

1. Create a visible stack using C-graphics
 2. Create a visible Queue using C-graphics
-

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE
CBCS - BSc(Computer Science) - II YEAR - SEMESTER-IV (w.e.f. 2016-'17)
DATA STRUCTURES
MODEL QUESTION PAPER

Time: 3 Hours

Max. Marks : 75

SECTION-A

*Answer any **FIVE** of the following Questions:*

(5 x 5= 25 Marks)

1. Explain about ADT.
2. Write about storage structures
3. What are the applications of stack? Explain
4. Write the differences between stack and queue
5. Write about fully and complete binary Tree
6. Write about tree terminologies
7. What is Graph? Write the representation of adjacency matrix
8. Write short notes on BFS.
9. What is sorting? Write an algorithm for Bubble sort
10. What is searching? Explain about sequential search.

SECTION - B

*Answer any **FIVE** of the following Questions*

(5 × 10 =50 Marks)

11. Write the classification of Data structures with diagram?
12. Explain about primitive data structures.
13. What are the operations performed on stacks with neat diagram?
14. Write the algorithm for Queue insert and Queue Delete
15. What is Binary tree? Write the Tree traversal techniques in Binary tree.
16. What is Binary search tree Give an example?
17. Write about Minimum Spanning tree?
18. Explain BFS and DFS
19. What is insertion sort? Explain the procedure with an Example?
20. Explain about Binary search.

Instruction to Paper Setter:

Two questions must be given from each unit in Section-A and Section-B

Structure of Computer Science/Information Technology (IT) Syllabus

DATA STRUCTURES USING JAVA LAB

1. Write a Program to implement the Linked List operations
 2. Write a Program to implement the Stack operations using an array.
 3. Write Programs to implement the Queue operations using an array.
 4. Write Programs to implement the Stack operations using a singly linked list.
 5. Write Programs to implement the Queue operations using a singly linked list.
 6. Write a program for arithmetic expression evaluation
 7. Write a program to implement Double Ended Queue using a doubly linked list.
 8. Write a program to search an item in a given list using Linear Search and Binary Search
 9. Write a program for Quick Sort
 10. Write a program for Merge Sort
 11. Write a program on Binary Search Tree operations(insertion, deletion and traversals)
 12. Write a program for Graph traversals.
-

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE
B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS
SEMESTER – V, PAPER- 5
RING THEORY & MATRICES

60 Hrs

UNIT – I (12 hrs) : Rings-I :-

Definition of Ring and basic properties, Boolean Rings, Zero Divisors of Ring - Cancellation laws in a Rings - Integral Domain Division Ring – Fields Examples.

UNIT –II (12 hrs) : Rings-II :-

Characteristic of Ring – Characteristic of an Integral Domain – Characteristic of Field Characteristic of Boolean Ring.

Sub Ring Definition – Sub ring test – Union and Intersection of sub rings – Ideal Right and left Ideals – Union and Intersection of Ideals. Excluding Principal prime and maximal Ideals.

UNIT –III (12 hrs) : Rings-III :-

Definition of Homomorphism – Homomorphic Image – Elementary Properties of Homomorphism –Kernel of a Homomorphism – Fundamental theorem of Homomorphism.

UNIT – IV (12 hrs) Matrix-I :-

Rank of a Matrix – Elementary operations – Normal form of a matrix Echelon form of a Matrix - Solutions of Linear Equations System of homogenous Linear equations – System of non Homogenous Linear Equations method of consistency.

UNIT – V (12 hrs) Matrix-II :-

Characteristic Roots, Characteristic Values & Vectors of square Matrix, Cayley – Hamilton Theorem.

Prescribed Text books:

1. Abstract Algebra by J. Fraleigh, Published by Narosa Publishing house.
2. A text Book of B.Sc., Mathematics by B.V.S.S.Sarma and others, published by S. Chand & Company Pvt. Ltd., New Delhi.

Reference Books :-

1. Rings and Linear Algebra by Pundir & Pundir, Published by Pragathi Prakashan.
2. Matrices by Shanti Narayana, published by S.Chand Publications.

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on Ring theory and its applications

Instruction to Paper Setter:

Two questions must be given from each unit in Part-A and Part-B

1. 3 questions
2. 1 question
3. 11. CD 2001
4. 8/11/11
5-7/11/11

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.

B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS

SEMESTER - V, PAPER - 5

MODEL QUESTION PAPER

RING THEORY & MATRICES

Time: 3 Hours

Max. Marks : 75

PART - A

I. Answer any FIVE of the following Questions :
(Marks)

(5 X 5 = 25)

1. Define Types of rings and give one example for each.
2. If R is a Boolean ring then prove that $a+a=0 \forall a \in R$.
3. If the characteristic of a ring is 2 and $ab=ba$ then prove that $(a+b)^2 = a^2 + b^2 = (a-b)^2 \forall a, b \in R$.
4. State and prove "Sub ring test".
5. If $f: R \rightarrow R^1$ be a homomorphism of a ring R into a ring R^1 and $0 \in R, 0^1 \in R^1$ be the zero elements then prove (1) $f(0) = 0^1$ (2) $f(-a) = -f(a) \forall a \in R$.
6. Prove that the Homomorphic image of a Commutative ring is Commutative.
7. Obtain the rank of the matrix $A = \begin{bmatrix} -1 & 2 & 0 \\ 3 & 7 & 1 \\ 5 & 9 & 3 \end{bmatrix}$.
8. Show that the system $x+2y+3z=0, 7x+13y+9z=0, 2x+3y+4z=0$ has trivial solution only.
9. Find the characteristic equation of the matrix $A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 0 & -1 \\ 2 & -1 & 0 \end{bmatrix}$.
10. Find the Eigen values of $A = \begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$.

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE
B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS
SEMESTER – V, PAPER -6
LINEAR ALGEBRA

60 Hrs

UNIT – I (12 hrs) : Vector Spaces-I :

Vector Spaces, General properties of vector spaces, n-dimensional Vectors, addition and scalar multiplication of Vectors, internal and external composition, Null space, Vector subspaces, Algebra of subspaces, Linear Sum of two subspaces, linear combination of Vectors, Linear span Linear independence and Linear dependence of Vectors.

UNIT –II (12 hrs) : Vector Spaces-II :

Basis of Vector space, Finite dimensional Vector spaces, basis extension, co-ordinates, Dimension of a Vector space, Dimension of a subspace, Quotient space and Dimension of Quotient space.

UNIT –III (12 hrs) : Linear Transformations :

Linear transformations, linear operators, Properties of L.T, sum and product of LTs, Algebra of Linear Operators, Range and null space of linear transformation, Rank and Nullity of linear transformations – Rank – Nullity Theorem.

UNIT –IV (12 hrs) : (Inner product space-I) :

Inner product spaces, Euclidean and unitary spaces, Norm or length of a Vector, Schwartz inequality, Triangle in Inequality, Parallelogram law.

UNIT –V (12 hrs) : (Inner product space-II) :

Orthogonal and Orthonormal Vectors, Orthogonal and Orthonormal Sets of Inner product Space, Pythagoras theorem, The Diagonals are perpendicular in a rhombus, orthogonal set of non-zero vectors is linearly independent, orthonormal set of vectors is linear independent, Gram-schmidt Orthogonalisation process, Bessel's Inequality and parseval's Identity.

Reference Books :

1. Linear Algebra by J.N. Sharma and A.R. Vasista, published by Krishna Prakashan Mandir, Meerut-250002.
2. Linear Algebra by Kenneth Hoffman and Ray Kunze, published by Pearson Education (low priced edition), New Delhi.
3. Linear Algebra by Stephen H. Friedberg et al published by Prentice Hall of India Pvt. Ltd. 4th Edition 2007.

Suggested Activities :

Seminar/ Quiz/ Assignments/ Project on “Applications of Linear algebra Through Computer Sciences”

Instruction to Paper Setter:

Two questions must be given from each unit in Part-A and Part-B2.

1. S. S. S. S. S.
2. U. C. C. C. C.
3. S. S. S.
4. S. S. S.
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**BLUE PRINT OF QUESTION PAPER
(INSTRUCTIONS TO PAPER SETTER)
B.A./B.Sc. MATHEMATICS SEMESTER-V (PAPER-6)
(LINEAR ALGEBRA)**

NOTE :- Paper Setter Must select TWO Short Questions and TWO Easy Questions from Each Unit as Follows :-

| PAPER | TOPICS | 5 MARKS QUESTIONS | 10 MARKS QUESTIONS |
|------------|--|----------------------------|----------------------------|
| UNIT - I | Subspace | 1 (Theorem) | 1 (Theorem) |
| | Linear Combination, Linear dependent and Independent | 1 (Problem) | 1 (Theorem) |
| UNIT - II | Basis of a vector Space | 1 (Problem)
1 (Theorem) | 1 (Theorem)
1 (Problem) |
| UNIT - III | Linear Transformation | 2 (Problems) | |
| | Range, Null Space, Rank | | 1 (Theorem)
1 (Problem) |
| UNIT - IV | Inner Product Space | 1 (Problem)
1 (Theorem) | 2 (Theorems) |
| UNIT - V | Orthogonal and Orthonormal Vectors | 1 (Problem)
1 (Theorem) | 2 (Theorems) |

1. 3 questions
2. ~~1~~
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VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE
B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS
SEMESTER - V, PAPER - 6
MODEL QUESTION PAPER
LINEAR ALGEBRA

Time: 3 Hours

Max. Marks : 75

PART - A

I. Answer any FIVE of the following Questions : (5 X 5= 25 Marks)

1. Prove that intersection of two subspaces is again a subspace.
2. Show that the system of vector $(1,3,2), (1,-7,-8), (2,1,-1)$ of $V_3(R)$ is Linearly dependent.
3. State and prove "Invariance theorem".
4. Show that the vectors $(1,1,2), (1,2,5), (5,3,4)$ of $R^3(R)$ do not form a basis set of $R^3(R)$.
5. Show that the mapping $T: V_3(R) \rightarrow V_2(R)$ is defined by $T:(x, y, z) = (x-y, x-z)$ is a Linear Transformation.
6. $T: V_3(R) \rightarrow V_2(R)$ and $H: V_3(R) \rightarrow V_2(R)$ be two Linear Transformations $T(x, y, z) = (x-y, y+z)$ and $H(x, y, z) = (2x, y-3)$ Find (i) $H+T$ (ii) aH .
7. State and prove Triangle Inequality.
8. If α, β are two vectors in Euclidean space $V(R)$ such that $\|\alpha\| = \|\beta\|$ prove that $(\alpha + \beta, \alpha - \beta) = 0$.
9. In an inner product space prove that $u - v, u + v$ are orthogonal if $\|u\| = \|v\|$.
10. State and prove Pythagoras Theorem.

PART - B

Answer any **FIVE** of the following Questions.

Choosing at least **ONE** Question from Each Section. (5 × 10 = 50 Marks)

SECTION - A

UNIT - I

11. If $V(F)$ be a vector space. $\omega \subseteq V$. Prove that the necessary and sufficient conditions for ω to be a subspace of V are
- (i) $\alpha \in \omega, \beta \in \omega \Rightarrow \alpha - \beta \in \omega$
- (ii) $a \in F, \alpha \in \omega \Rightarrow a\alpha \in \omega$.
12. If show that are the sub sets of a vector space $v(F)$ then prove that $L(S \cup T) = L(S) + L(T)$.

UNIT - II

13. State and prove Basis Existence theorem.
14. ω_1 and ω_2 be two subspaces of R^4 .

$$\omega_1 = \{(a, b, c, d) : b - 2c + d = 0\}$$

$$\omega_2 = \{(a, b, c, d) : a = d, b = 2c\}$$

Find $\dim(\omega_1 + \omega_2)$

UNIT - III

15. Find $T(x, y, z)$ where $T: R^3 \rightarrow R$ is defined by $T(1, 1, 1) = 3$,
 $T(0, 1, -2) = 1$, $T(0, 0, 1) = -2$.
16. Define Null space. Prove that Null space $N(T)$ is subspace of $U(F)$ where $T: U \rightarrow V$ is a Linear Transformation.

SECTION - B

UNIT - IV

17. State and prove parallelogram Law.
18. If α, β and two vectors in an I.P.S. then prove that α, β are Linear Independent iff $|\langle \alpha, \beta \rangle| = \|\alpha\| \|\beta\|$.

UNIT - V

19. Prove that in an I.P.S. any orthonormal set of vectors in Linear independent.
20. State and prove Bessel's inequality.

1. 3 proved
2. ~~3. 4. 5.~~
3. 4. 5. 6. 7. 8. 9. 10.
4. 5. 6. 7. 8. 9. 10.
5-7. 8. 9. 10.

**Paper V: Electricity, Magnetism & Electronics
(For Maths Combinations)**

V - Semester

Work load: 60 hrs per semester

4 hrs/week

UNIT-I (12 hrs)

1. Electric field intensity and potential:

Gauss's law statement and its proof- Electric field intensity due to (1) Uniformly charged sphere and (2) an infinite conducting sheet of charge.

2. Dielectrics:

Electric dipole moment and molecular polarizability- Electric displacement D, electric polarization P – relation between D, E and P- Dielectric constant and susceptibility.

UNIT-II (12 hrs)

3. Electric and magnetic fields

Biot-Savart's law, explanation and calculation of B due to long straight wire, a circular current loop and solenoid– Hall effect – determination of Hall coefficient and applications.

4. Electromagnetic induction

Faraday's law-Lenz's law- Self and mutual inductance, calculation of self inductance of a long solenoid, energy stored in magnetic field.

UNIT-III (12 hrs)

5. Alternating currents and electromagnetic waves

Alternating current - Relation between current and voltage in LR and CR circuits, vector diagrams, LCR series and parallel resonant circuit, Q –factor.

6. Maxwell's equations

Idea of displacement current - Maxwell's equations (integral and differential forms) (no derivation), Maxwell's wave equation (with derivation).

UNIT-IV (12 hrs)

7. Basic electronics:

PN junction diode, Zener diode, Tunnel diode, I-V characteristics, PNP and NPN transistors, CB, CE and CC configurations – Relation between α , β and γ - transistor (CE) characteristics.

UNIT-V: (12 hrs)

8. Digital electronics

Number systems - Conversion of binary to decimal system and vice versa. Binary addition and subtraction (1's and 2's complement methods). Laws of Boolean algebra - De Morgan's laws-statement and proof, Basic logic gates, NAND and NOR as universal gates, exclusive-OR gate, Half adder and Full adder.

REFERENCE BOOKS :

1. BSc Physics, Vol.3, Telugu Academy, Hyderabad.
2. Electricity and Magnetism, D.N. Vasudeva. S. Chand & Co.
3. Electricity, Magnetism with Electronics, K.K.Tewari, R.Chand & Co.,
4. Principles of Electronics, V.K. Mehta, S.Chand & Co.,
5. Digital Principles and Applications, A.P. Malvino and D.P. Leach, Mc GrawHill Edition.

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.
THREE YEAR B.Sc DEGREE EXAMINATION
FINAL YEAR EXAMINATION
SEMESTER-V :: SUB : PHYSICS (WITH MATHS) (PAPER-V)
MODEL PAPER

Time: 3 Hours

Max. Marks : 75

SECTION -A

Answer ALL the following Questions :

(5 X 10 = 50Marks)

1. (a) Derive an expression for the electric field due to a uniformly charged sphere.
(OR)
(b) What is meant by a dielectric? Derive the relation between the vectors D, E and P.
2. (a) Derive an expression for the magnetic field inside long solenoid carrying a current i.
(OR)
(b) What is self inductance and obtain an expression for self inductance of a solenoid.
3. (a) Explain LCR series resonance circuit with necessary theory.
(OR)
(b) What is meant by displacement current and Derive electromagnetic wave equation.
4. (a) What are p-type and N-type semi conductors. Explain the I.V. characteristics of P-N junction diode.
(OR)
(b) Name the possible transistor connections. Explain the working of common emitter transistor.
5. (a) What are universal gates? Draw their truth tables and draw the circuits of OR, AND and NOT gates by using NOR gate.
(OR)
(b) State and prove demorgan's theorems.

SECTION - B

Answer any THREE of the following questions :

(3 X 5 = 15 Marks)

6. State and prove gauss law in electricity.
7. Explain biot-savart's law.
8. Write about L-R circuit.
9. Write a short note on zener diode.
10. Explain basic logic gates with truth tables.

SECTION - C

Answer any TWO of the following questions :

(2 X 5 = 10 Marks)

11. A charged sphere of $80 \mu c$ is placed in air, find the electric field intensity at a point 20 cm from the centre of the sphere.
12. An infinitely long conductor carries a current 10 mA. Find the magnetic field at a point 10cm away from it.
13. A capacitance of $50 \mu F$ and an inductance 0.2025H are connecting in series. If the resistance of the circuit is negligible, find the resonance frequency.
14. In a transistor base current and emitter current are 0.08 mA and 9.6 mA respectively, calculate the collector current, α and β .
15. Convert $(27.25)_{10}$ in to binary and $(111.011)_2$ in to decimal.

**Paper VI: Modern Physics
(For Maths Combinations)
V Semester**

Work load: 60 hrs per semester

4 hrs/week

UNIT-I (12 hrs)

1. Atomic and molecular physics

Introduction – Drawbacks of Bohr’s atomic model- Sommerfeld’s elliptical orbits-relativistic correction (no derivation). Vector atom model and Stern-Gerlach experiment. Zeeman effect and its experimental arrangement.

Raman effect, hypothesis, Stokes and Anti Stokes lines. Quantum theory of Raman effect. Experimental arrangement – Applications of Raman effect.

UNIT-II (12 hrs)

2. Matter waves & Uncertainty Principle

Matter waves, de Broglie’s hypothesis - wavelength of matter waves, Properties of matter waves - Davisson and Germer experiment. Heisenberg’s uncertainty principle for position and momentum (x and p), & energy and time (E and t).

UNIT-III (12 hrs)

3. Quantum (wave) mechanics

Basic postulates of quantum mechanics-Schrodinger time independent and time dependent wave equations-derivations. Application of Schrodinger wave equation to particle in one dimensional infinite box.

UNIT-IV(12 hrs)

4. General Properties of Nuclei

Basic ideas of nucleus -size, mass, charge density (matter energy), binding energy, angular momentum, parity, magnetic moment, electric moments. Liquid drop model and Shell model (qualitative aspects only).

5. Radioactivity decay:

Alpha decay: basics of α -decay processes. Theory of α -decay, Gamow’s theory, Geiger Nuttal law. β -decay.

UNIT-V (12 hrs)

6. Crystal Structure

diffraction of X-rays by crystals, Bragg’s law, experimental techniques, Laue’s method and powder diffraction method.

7. Superconductivity:

Introduction - experimental facts, critical temperature - critical field - Meissner effect – Isotope effect - Type I and type II superconductors - applications of superconductors.

REFERENCE BOOKS

1. BSc Physics, Vol.4, Telugu Akademy, Hyderabad
2. Molecular Structure and Spectroscopy by G. Aruldhas. Prentice Hall of India, New Delhi.
3. Modern Physics by R. Murugesan and Kiruthiga Siva Prasath. S. Chand & Co.
4. Modern Physics by G. Aruldhas & P. Rajagopal. Eastern Economy Edition.
5. Concepts of Modern Physics by Arthur Beiser. Tata McGraw-Hill Edition.
6. Quantum Mechanics, Mahesh C Jain, Eastern Economy Edition.
7. Nuclear Physics, Irving Kaplan, Narosa publishing House.
8. Nuclear Physics, D.C.Tayal, Himalaya Publishing House.
9. Elements of Solid State Physics, J.P.Srivastava, Prentice Hall of India Pvt., Ltd.
10. Solid State Physics, A.J. Dekker, McMillan India.

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.
THREE YEAR B.Sc DEGREE EXAMINATION
FINAL YEAR EXAMINATION
SEMESTER-V :: SUB : PHYSICS (WITH MATHS) (PAPER-VI)
MODEL PAPER

Time: 3 Hours

Max. Marks : 75

SECTION -A

Answer ALL the following Questions :

(5 X 10 = 50Marks)

1. (a) Describe Stern – Gerlach Experiment.
(OR)
(b) What is Raman effect? Describe the experimental setup used in the study of Raman effect.
2. (a) Illustrate an experiment of Davisson and Germer to demonstrate the wave character of electrons.
(OR)
(b) Explain the consequences of uncertainty relation and the gamma ray microscope experiment.
3. (a) Derive the energy Eigen values of Schrodinger wave equation to a particle in one dimensional infinite box.
(OR)
(b) Obtain Schrodinger (i) Time independent and (2) Time dependent wave equations.
4. (a) What is Range of α – particles? Write its experimental proof.
(OR)
(b) Explain how the shell model of nucleus accounts for the existence of magic numbers.
5. (a) Describe the Laue method for the analysis of crystal structure.
(OR)
(b) Write brief note on super conductivity and write its applications.

SECTION - B

Answer any THREE of the following questions :

(3 X 5 = 15 Marks)

6. Describe the experimental arrangement of Zeeman effect.
7. Explain Debroglie's hypothesis of matter waves.
8. Write the basic postulates of quantum mechanics.
9. Explain Geiger – Natal law.
10. Write briefly about Bragg's law.

SECTION - C

Answer any TWO of the following questions :

(2 X 5 = 10 Marks)

11. The exciting line in an experiment is 5460 \AA and the Stokes line is at 5520 \AA . Find the wave length of anti-Stokes line.
12. What is the de-broglie's wave length of an electron which has been accelerated from rest through a potential difference 100V.
13. Find the Binding Energy of an α -particle from the following data
(i) $M_N = 4.001265 \text{ am.u.}$ (ii) $m_p = 1.007277 \text{ a.m.u}$ (iii) $m_n = 1.008665 \text{ a.m.u.}$ and
(iv) $1 \text{ a.m.u} = 931.5 \text{ MeV.}$
14. Find the least energy of an electron moving in the dimension in an infinitely high potential box of width 1 \AA , $m_e = 9.11 \times 10^{-31} \text{ kg}$ and $h = 6.63 \times 10^{-34} \text{ J.s.}$
15. Calculate the wave length of an X-Ray beam incident at 12° for the first order reflection from a calcite crystal, if $d = 3.035 \text{ \AA}$.

Structure of Computer Science/Information Technology (IT) Syllabus
III YEAR V SEMESTER

Paper-V: Data Base Management System

Course Objective:

Design & develop database for large volumes & varieties of data with optimized data processing techniques.

Course Outcomes

On completing the subject, students will be able to:

1. Design and model of data in database.
2. Store, Retrieve data in database.

Unit-I: Overview of Database Management System: Introduction, Data and Information, Database, Database Management System, Objectives of DBMS, Evolution of Database Management Systems, Classification of Database Management System.

Unit-II: File-Based System, Drawbacks of File-Based System, Advantages of DBMS, Services of DBMS, Components of Database System, CODD'S Rules
The Relational Database Model: Integrity Rules, Relational Set Operators, Relationships within the Relational Database,

Unit-III: Entity-Relationship Model: Introduction, The components of an Entity-Relationship model, entities, attributes, relationships, Classification of Entity Sets, Attribute Classification, Relationship Degree, Relationship Classification. Normalization, Normal forms (1NF,2NF,3NF,BCNF)

Unit-IV: Structured Query Language: Introduction, Commands in SQL, SQL literals, Data types in SQL, SQL operators, Data Definition Language (DDL) commands, Data Manipulation Language commands, Table Modification, Table Truncation, Queries, Sub queries, Aggregate Functions, Set Operators

Unit-V: PL/SQL: Introduction, Structure of PL/SQL program, PL/SQL Data Types, PL/SQL operators, Steps to Create a PL/SQL Program, Control Structures: conditional control statements, Iterative Control statements, Cursors, Steps to create a Cursor

Andhra Pradesh State Council of Higher Education
B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS
w.e.f.2017-2018

Structure of Computer Science/Information Technology (IT) Syllabus

TEXT BOOKS:

1. Peter Rob, Carlos Coronel, Database Systems Design, Implementation and Management, Seventh Edition, Thomson (2007)
2. SQL, PL/SQL the Programming Language of Oracle, Ivan Bayross, BPB publications

Reference Books

1. Paneerselvam: Database Management Systems, PHI.
2. "Database System Concepts" by Abraham Silberschatz, Henry Korth, and S. Sudarshan, McGrawhill, 2010, 9780073523323
3. "Database Management Systems" by Raghu Ramakrishnan, McGrawhill, 2002,
4. Fundamentals of Relational Database Management Systems by S. Sumathi, S. Esakkirajan, Springer Publications
5. "Fundamentals of Database Systems" by R. Elmasri and S. Navathe

Student Activity:

1. **Create your college database for placement purpose.**
Create faculty database of your college with their academic performance scores

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE

**CBCS – BSc(COMPUTER SCIENCE) - III YEAR - SEMESTER-V
DATABASE MANAGEMENT SYSTEM
MODEL QUESTION PAPER**

Time: 3 Hours

Max. Marks : 75

Section-A

Answer any FIVE of the following Questions:

(5 x 5= 25 Marks)

1. Describe the following
a) Data b) information c) DBMS
2. Write the objectives of DBMS
3. Explain the Services of DBMS
4. What are the Components of DBMS? Explain
5. What is an entity and explain their types.
6. Explain the relationship degree with an example
7. Define literal. Write about various literals used in SQL
8. Explain aggregate functions
9. Briefly explain the block structure of PL/SQL suitable example
10. Write steps to create a PL/SQL program

Section-B

Answer any FIVE of the following Questions:

(5 x 10= 50 Marks)

11. Explain evolution of database management system
12. Classification of data base management system
13. Explain advantages of DBMS
14. Write a short note on ER model
15. What is normalization? Explain normal forms with an example
16. Explain relationship within the relational database
17. Explain about data manipulation commands
18. Explain about relational set operators with examples
19. Write about iterative control structures
20. Explain cursors and their types

Instruction to Paper Setter:

Two questions must be given from each unit in Section-A and Section-B

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR V SEMESTER

DATABASE MANAGEMENT SYSTEMS LAB

1. Draw ER diagrams for train services in a railway station
2. Draw ER diagram for hospital administration
3. Creation of college database and establish relationships between tables
4. Creation of reports based on queries
5. Creation of a table with constraints
6. Write a program to find factorial of a number
7. Write a program to find sum of digits of an integer
8. Write a program to demonstrate a function
9. Write a program to demonstrate cursors
10. Write a program to demonstrate Aggregate functions

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR V SEMESTER
Paper VI : Software Engineering

Course Objectives

The Objective of the course is to assist the student in understanding the basic theory of software engineering, and to apply these basic theoretical principles to a group software development project.

Course outcomes

1. Ability to gather and specify requirements of the software projects.
2. Ability to analyze software requirements with existing tools
3. Able to differentiate different testing methodologies
4. Able to understand and apply the basic project management practices in real life projects
5. Ability to work in a team as well as independently on software projects

UNIT I

INTRODUCTION: The Evolving Role of Software – Software and its characteristics – Software Myths – Software Engineering – Components of Software Engineering – Software Engineering – A Layered Technology. Reactive Vs Proactive Risk Strategies – types of Software Risks – Risk Management process

UNIT II

SOFTWARE PROCESS MODELS: Prescriptive Models – The waterfall Model – Incremental Process Models: The Incremental Model, The RAD Model, Evolutionary Process Model: Prototyping Model, The spiral Model

UNIT III

REQUIREMENTS ENGINEERING: Requirements Engineering Tasks, Initiating the Requirement Engineering Process.

BUILDING THE ANALYSIS MODEL: Requirements Analysis, Analysis Modeling Approaches, Data Modeling Concepts, Flow – oriented Modeling: Creating a Data Flow Model.

UNIT IV

SOFTWARE DESIGN: Design Process & Design Quality – Design concepts – Architectural styles & Patterns. Quality Management: Quality Concepts – Software Quality Assurance

UNIT V

SOFTWARE QUALITY AND TESTING : Functional Testing – System Testing – User satisfaction Testing – Test Cases – Test plans.

SOFTWARE PROJECT MANAGEMENT (SPM): Introduction – SPM basics – Project Management –Project Integration Management – Project Life Cycle.

Andhra Pradesh State Council of Higher Education
B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS
w.e.f.2017-2018

Structure of Computer Science/Information Technology (IT) Syllabus

TEXT BOOKS:

1. Roger Pressman S., "Software Engineering: A Practitioner's Approach", McGraw Hill, 2010.

REFERENCE BOOKS:

1. Software Engineering Principles and Practice by Deepak Jain Oxford University Press
2. Sommerville, "Software Engineering", Eighth Edition, Pearson Education, 2007
3. Pfleeger, "Software Engineering: Theory & Practice", 3rd Edition, Pearson Education, 2009
4. Carlo Ghazi, Mehdi Jazayari, Dino Mandrioli, "Fundamentals of Software Engineering", Pearson Education, 2003

Student Activity:

1. Visit any financial organization nearby and prepare requirement analysis report
2. Visit any industrial organization and prepare risk chart.

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**CBCS – BSc(COMPUTER SCIENCE) - III YEAR - SEMESTER-V
SOFTWARE ENGINEERING
MODEL QUESTION PAPER**

Time: 3 Hours

Max. Marks : 75

Section-A

Answer any FIVE of the following Questions:

(5 x 5= 25 Marks)

1. Define software and explain its characteristics.
2. List and Explain software myths.
3. Write advantages & disadvantages of waterfall model.
4. Define Incremental model.
5. Write about initiating requirements engineering process.
6. Draw level 0 and level 1 DFD for ATM system.
7. Write quality concepts.
8. Define design process.
9. Discuss about Software Project Management basics.
10. Define test plans.

Section-B

Answer any FIVE of the following Questions:

(5 x 10= 50 Marks)

11. Explain components of software engineering.
12. What is a risk? Explain its types in detail.
13. Explain about RAD model.
14. What is spiral model? Explain in detail.
15. Discuss about requirements engineering tasks.
16. Explain Analysis models.
17. Define and explain Software Quality Assurance.
18. Write about Design concepts in software design.
19. What is software testing? Explain Functional testing.
20. Explain software Project life cycle.

Instruction to Paper Setter:

Two questions must be given from each unit in Section-A and Section-B

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR V SEMESTER
Software Engineering Lab

1. Studying various phases of Water-Fall Model.
2. Prepare SRS for Banking or On line book store domain problem
3. Calculate effort using FP oriented estimation model
4. Analyze the Risk related to the project and prepare RMMM plan.
5. Develop Time-line chart and project table using PERT or CPM project scheduling methods.
6. Draw E-R diagram, DFD, CFD and STD for the project.
7. Design of the test cases.
8. Prepare FTR. Version control and change control for software configuration item

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B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS
SEMESTER – VI, PAPER – VII-(A)
VECTOR CALCULUS

60 Hrs

UNIT – I (12 hrs) : Vector Differentiation – I :-

Vector Function of Scalar Variable continuity of a vector function partial differentiation scalar point function vector point function – Gradient of a scalar point function – Unit normal – Directional Derivative at a Point – Angle between two surfaces.

UNIT – II (12 hrs) : Vector Differentiation – II :-

Vector differential Operator – Scalar Differential Operator – Divergence of a vector – Solenoidal vector – Laplacian operator – curl of a vector – Ir rotational Vector – Vector identities.

UNIT – III (12 hrs) : Vector Integration - I :-

Definition – Integration of a vector – simple problems – smooth curve – Line integral – Tangential Integral – circulation Problems on line Integral. Surface Integral – Flux Problems on Surface Integral.

UNIT – IV (12 hrs) : Vector Integration - II :-

Volume Integrals – Gauss Divergence Theorem statement and proof – Applications of Gauss Divergence theorem.

UNIT – V (12 hrs) : Vector Integration - III :-

Green's Theorem in a plane Statement and proof – Application of Green's Theorem.
Statement and Proof of Stoke Theorem – Application of stoke Theorem.

Prescribed Text books:

A text Book of B.Sc., Mathematics by B.V.S.S.Sarma and others, published by S. Chand & Company Pvt. Ltd., New Delhi.

Reference Books :-

1. Vector Calculus by Santhi Narayana, Published by S. Chand & Company Pvt. Ltd., New Delhi.
2. Vector Calculus by R. Gupta, Published by Laxmi Publications.
3. Vector Calculus by P.C. Matthews, Published by Springer Verlag publications.

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on Vector Calculus and its applications

Instruction to Paper Setter:

Two questions must be given from each unit in Part-A and Part-B

1. 3 questions
2. 1 question
3. 1 question
4. 1 question
5-710 de

**BLUE PRINT OF QUESTION PAPER
(INSTRUCTIONS TO PAPER SETTER)
B.A./B.Sc. MATHEMATICS
(SEMESTER-VI) PAPER-VII-(A)
VECTOR CALCULUS**

NOTE :- Paper Setter Must select TWO Short Questions and TWO Easy Questions from Each Unit as Follows :-

| UNIT | TOPICS | 5 MARKS QUESTIONS | 10 MARKS QUESTIONS |
|------------|--|----------------------------|----------------------------|
| UNIT - I | Introductions Gradient | 2 (Problems) | - |
| | Unit Normal, Directional Derivates
Angle Between two Surfaces | - | 2 (Problems) |
| UNIT - II | Degree of a vector Curl, Solenoidal,
Ir rotational | 2 (Problems) | |
| | Laplace operator Vector identities | - | 1(Problem)+
1(Theorem) |
| UNIT - III | Integration of a Vector | 2 (Problems) | |
| | Line Integral | - | 1(Problem) |
| | Surface Integral | - | 1(Problem) |
| UNIT - IV | Volume Integral
Gauss Divergence | 2 (Problems) | - |
| | Gauss Divergence Theorem | - | 1 (Theorem)
1 (Problem) |
| UNIT - V | Green's Theorem + Stoke Theorem | 1 (Theorem)
1 (Problem) | 1 (Theorem)
1 (Problem) |

1. 3 questions
2. ~~1~~
3. 11. 10 equal
4. 8/11
- 5-4/11 de

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.

B.A./B.Sc. THIRD YEAR MATHEMATICS

SEMESTER – VI, PAPER – VII-(A)

VECTOR CALCULUS

MODEL QUESTION PAPER

TIME : 3 Hours

Max.Marks : 75

PART – A

I. Answer any FIVE Questions :

5 X 5 = 25M

1. Prove that $\nabla\left(\frac{1}{r}\right) = \frac{-\vec{r}}{r^3}$.
2. Find grad f at (1,1,-2) when $f = x^3 + y^3 + 3xyz$.
3. If $\vec{f} = xy^2\vec{i} + 2x^2yz\vec{j} + 3yz^2\vec{k}$ find curl \vec{f} at (1,-1,1).
4. Define solenoidal vector show that $3y^4z^2\vec{i} + 4x^3z^3\vec{j} + 3x^2y^2\vec{k}$ is solenoidal.
5. If $\vec{F}(t) = (t-t^2)\vec{i} + 2t^3\vec{j} - 3\vec{k}$ find $\int_1^2 \vec{F}(t) dt$.
6. If $\vec{A} = t\vec{i} - t^2\vec{j} + (t-1)\vec{k}$
 $\vec{B} = 2t^2\vec{i} + 6t\vec{k}$
find $\int_0^2 (\vec{A} \times \vec{B}) dt$.
7. By Divergence theorem evaluate $\int_S \vec{F} \cdot \vec{n} ds$ where $\vec{F} = 4xy\vec{i} + y^3\vec{j} - xz\vec{k}$
when in the surface $x=0, x=1, y=0, y=1, z=0, z=1$.
8. Applying Gauss theorem to prove $\int_S N\phi ds = \int_V \nabla\phi dr$.
9. State and prove Green's theorem.
10. Evaluate by stoke theorem $\int_S \vec{F} \cdot d\vec{r}$ when $\vec{F} = yz\vec{i} + 3x\vec{j} + xy\vec{k}$ and C is the curve
 $x^2 + y^2 = 1, z = y^2$.

PART - B

Answer any **FIVE** of the following Questions.

Choosing at least **ONE** Question from Each Section.

(5 × 10 = 50 Marks)

SECTION - A

UNIT - I

11. If $a = x + y + z, b = x^2 + y^2 + z^2, c = xy + yz + 3x$ prove that $[\nabla a, \nabla b, \nabla c] = 0$.
12. Find the Directional derivative of $f = xy + yz + zx$ in the direction of the vector $i + 2j + 2k$ at $(1, 2, 0)$.

UNIT - II

13. Prove that $\text{div}(\bar{A} \times \bar{B}) = \bar{B} \text{ curl } \bar{A} - \bar{A} \text{ curl } \bar{B}$.
14. Prove that $\nabla^2 \left(\frac{x}{r^3} \right) = 0$.

UNIT - III

15. If $\bar{F} = 3xyi - y^2j$ evaluate $\int_C \bar{F} \cdot d\bar{r}$ when C is the curve $y = 2x^2$ in xy plane from $(0, 0)$ to $(1, 2)$.
16. If $\bar{F} = 2yi - 3j + x^2k$ and S is the surface $y^2 = 8x$ in the front octant bounded by the planes $y = 4$ and $z = 6$. Evaluate $\int_S \bar{F} \cdot \bar{n} \, ds$.

SECTION - B

UNIT - IV

17. State and prove Gauss's Divergence theorem.
18. If $\bar{F} = (2x^2 - 3z)i - 2xyj - 4xz$ then evaluate $\int_V \text{div } \bar{F} \, dV$ when V is the closed region bounded by the planes $x = 0, y = 0, z = 0$ and $2x + 2y + z = 4$.

UNIT - V

19. Evaluate by Green's Theorem.
 $\int_C (3x^2 - 8y^2) dx + (4y - 6xy) dy$ when C is the boundary defined by $x = 0, y = 0, x + y = 1$.
20. State and prove Stokes's Theorem.

Instruction to Paper Setter:

Two questions must be given from each unit in Part-A and Part-B

1. 3 questions
2. 1 question
3. 4. 2 questions
4. 3 questions
5-7th etc

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE
B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS
SEMESTER – VI, PAPER – VII-(B)
ELECTIVE–VII-(B); OPERATIONS RESEARCH

60 Hrs

UNIT-I (12 hrs):

Introduction to Operations Research, Definition of OR, Applications of OR, Limitations of OR, Linear programming problem (LPP), Introduction, Mathematical formulation of the LPP, Applications and Limitation of LPP.

UNIT-II (12 hrs):

Linear Programming Problem – Solution of LPP Using Graphical Method and Simplex Method (\leq inequality only).

UNIT-III (12 hrs):

Transportation problem: Mathematical formulation, IBFS of transportation problem using north-west corner rule, least-cost rule and Vogel's approximation method, Simple problems.

UNIT-IV (12 hrs):

Assignment problem, definition, mathematical formulation of assignment problem, solution of assignment problem using Hungarian algorithm, unbalanced assignment problem, simple problems, Difference between Assignment and transportation Problem.

UNIT-V (12 hrs):

Introduction – Definition – Terminology and Notations Principal Assumptions,
Problems with n Jobs through Two Machines
Problems with n Jobs through Three Machines

Prescribed Text Book:

Operations Research (2nd Edition) by S.Kalavathi, Vikas Publications Towers Pvt. Ltd.

Scope:

UNIT-I: 1.1, 1.2, 1.3, 1.5, 1.6, 1.7

UNIT-II: 2.1, 2.2, 2.2.1, 2.2.2, 3.1, 3.1.1, 4.1, 4.2, 4.3

UNIT-III: 8.1, 8.2, 8.3, 8.4.1, 8.4.2, 8.4.3

UNIT-IV: 9.1, 9.2, 9.2.1, 9.2.2, 9.3, 9.4

UNIT-V: 12.1, 12.2, 12.2.1, 12.2.2, 12.3, 12.4

Reference books:

1. Operations Research by Kanthiswaroop, P.K.Gupta, Manmohan by Sultan Chand & Sons
2. Operations Research by SD. Sharma, Published by Kedhar Nath ram Nath – Meerut.

INSTRUCTIONS TO PAPER SETTER:-

1. Two questions must be given from each unit in Part-A and Part-B
2. Number of constraints in LPP should be less than or equal to 3.
3. The order of transportation and assignment matrix should be less than or equal to 5.

3. 3 questions
2. 3
3. 5
4. 5
5-7/10 de

**BLUE PRINT OF QUESTION PAPER
(INSTRUCTIONS TO PAPER SETTER)
B.A./B.Sc. MATHEMATICS
SEMESTER – VI, PAPER – VII-(B)
ELECTIVE–VII-(B); OPERATIONS RESEARCH**

NOTE :- Paper Setter Must select TWO Short Questions and TWO Easy Questions from Each Unit as Follows :-

| UNIT | TOPICS | 5 MARKS QUESTIONS | 10 MARKS QUESTIONS |
|------------|--------------------------|-------------------------|--------------------|
| UNIT - I | Introduction of OR | 1(Theory) | 1(Theory) |
| | LPP | 1(Theory) | 1 (Problem) |
| UNIT - II | Simplex Graphical Method | 1(Theory)
1(Problem) | 2(Problems) |
| UNIT - III | Transportation | 1(Theory)
1(Problem) | 2(Problems) |
| UNIT - IV | Assignment problem | 1(Theory)
1(Problem) | 2(Problems) |
| UNIT - V | sequencing Jobs | 1(Theory)
1(Problem) | 2(Problems) |

1. 3 from 1
2. 1 from 2
3. 11. CP 1000
4. 8/11/11
5-7/11/11

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.

B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS

SEMESTER – VI, PAPER – VII-(B)

ELECTIVE–VII-(B); OPERATIONS RESEARCH

MODEL QUESTION PAPER

TIME : 3 Hours

Max.Marks : 75

PART – A

I. Answer any FIVE Questions :

5 X 5 = 25M

1. Explain the origin and development of operation research.
2. Explain the procedure to formulate a linear programming problem.
3. Explain the Simplex method to solve a linear programming problem.
4. Solve the following LPP by using graphical method

$$\max z = 8x_1 + 5x_2$$

$$\text{Subject to : } 2x_1 + x_2 \leq 500$$

$$x_1 \leq 150$$

$$x_2 \leq 250$$

$$x_1, x_2 \geq 0$$

5. Explain the mathematical formulation of transportation problem.
6. Determine an initial basic feasible solution to the following transportation problem using North west corner rule.

| | D_1 | D_2 | D_3 | D_4 | Supply |
|--------|-------|-------|-------|-------|--------|
| O_1 | 6 | 4 | 1 | 5 | 14 |
| O_2 | 8 | 9 | 2 | 7 | 16 |
| O_3 | 4 | 3 | 6 | 2 | 5 |
| Demand | 6 | 10 | 15 | 4 | |

7. Explain the difference between transportation and assignment problem.
8. Solve the following Assignment problem which Minimize the Total Cost.

| | A | B | C | D |
|---|----|----|----|----|
| 1 | 10 | 25 | 15 | 20 |
| 2 | 15 | 30 | 5 | 15 |
| 3 | 35 | 20 | 12 | 24 |
| 4 | 17 | 25 | 24 | 20 |

9. Explain the assumptions involved in sequencing problem.
10. There are five jobs each of which must go through the two machines A and B in the order A,B processing times are given below.

| <u>JOB</u> | <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> |
|------------------|----------|----------|----------|----------|----------|
| Machine-A | 5 | 1 | 9 | 3 | 10 |
| Machine-B | 2 | 6 | 7 | 8 | 4 |

Determine a sequence for the five jobs that will minimize the total elapsed time.

PART - B

Answer any **FIVE** of the following Questions.
Choosing at least **ONE** Question from Each Section.

(5 X 10 = 50Marks)

SECTION - A

UNIT - I

11. Explain advantages and limitations of operations research.
12. A paper mill produces two grades of paper namely x and y owing to raw material restrictions it cannot produce more than 400 tons of grade x and 300 tons of grade y in a week. There are 160 production hours in a week. It requires 0.2 and 0.4 hours to produce a ton of products x and y respectively with corresponding profits of Rs. 200/- and Rs. 500/- per ton. Formulate the above as an LPP to maximize profit.

UNIT - II

13. Solve the LPP by using graphical method
- objective function : $\max z = 3x_1 + 4x_2$
- Subject to : $4x_1 + 2x_2 \leq 80$
- $2x_1 + 5x_2 \leq 180$
- $x_1 \geq 0, x_2 \geq 0$
14. Use simplex method to solve the LPP.
- objective function : $\max z = 3x_1 + 2x_2$
- Subject to : $x_1 + x_2 \leq 4$
- $x_1 - x_2 \leq 2$
- $x_1, x_2 \geq 0$

UNIT - III

15. Use vogel's approximation method to obtain an initial basic feasible solution of the transportation problem.

| | D | E | F | G | Available |
|--------|-----|-----|-----|-----|-------------------|
| A | 11 | 13 | 17 | 14 | 250
300
400 |
| B | 16 | 18 | 14 | 10 | |
| C | 21 | 24 | 13 | 10 | |
| Demand | 200 | 225 | 275 | 250 | |

16. Find the initial basic feasible solution for the following data using least cost method.

| | A | B | C | Available |
|--------|---|---|----|-------------------|
| 1 | 2 | 7 | 4 | 5
8
7
14 |
| 2 | 3 | 3 | 1 | |
| 3 | 5 | 4 | 7 | |
| 4 | 1 | 6 | 2 | |
| Demand | 7 | 9 | 18 | |

SECTION - B

UNIT - IV

17. A department head has four tasks to be performed and three subordinates, the subordinates differ in efficiency the estimates of the time, each subordinate would take to perform is given below in the matrix. How should he allocate the tasks one to each man, so as to minimize the total Men - Hours?

| <u>Task</u> | <u>MEN</u> | | |
|-------------|------------|----------|----------|
| | <u>1</u> | <u>2</u> | <u>3</u> |
| I | 9 | 26 | 15 |
| II | 13 | 27 | 6 |
| III | 35 | 20 | 15 |
| IV | 18 | 30 | 20 |

18. Solve the following assignment problem in order to minimize the total cost. The matrix given below gives the assignment cost when different operators are assigned to various machines.

| | <u>I</u> | <u>II</u> | <u>III</u> | <u>IV</u> | <u>V</u> |
|----------|----------|-----------|------------|-----------|----------|
| A | 30 | 25 | 33 | 35 | 36 |
| B | 23 | 29 | 38 | 23 | 26 |
| C | 30 | 27 | 22 | 22 | 22 |
| D | 25 | 31 | 29 | 27 | 32 |
| E | 27 | 29 | 30 | 24 | 32 |

UNIT - V

19. In a factory, there are Six Jobs to perform, each of which should go through two machines A and B, in the order A, B. The processing time (in hours) for the Jobs are given below. You are required to determine the sequence for performing the Jobs that would minimize the total elapsed time T, what is the value of T?

| <u>JOB</u> | <u>J₁</u> | <u>J₂</u> | <u>J₃</u> | <u>J₄</u> | <u>J₅</u> | <u>J₆</u> |
|------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Machine-A | 1 | 3 | 8 | 5 | 6 | 3 |
| Machine-B | 5 | 6 | 3 | 2 | 2 | 10 |

20. We have five jobs each of which must go through the machines A,B and C in the order A,B,C. Determine the sequence that will minimize the total elapsed time.

| <u>JOB</u> | <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> |
|------------------|----------|----------|----------|----------|----------|
| Machine-A | 5 | 7 | 6 | 9 | 5 |
| Machine-B | 2 | 1 | 4 | 5 | 3 |
| Machine-C | 3 | 7 | 5 | 6 | 7 |

Instruction to Paper Setter :

Two questions must be given from each unit in Part-A and Part B.

1. 3-4-5-6-7
2. 1-2-3-4-5
4. 3-4-5-6-7
5-7-1-2-3

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE
B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS

SEMESTER – VI, PAPER – VII-(C)
ELECTIVE– VII-(C) : NUMBER THEORY

60 Hrs

UNIT-I (12 hours)

Divisibility – Greatest Common Divisor – Euclidean Algorithm – The Fundamental Theorem of Arithmetic

UNIT-II (12 hours)

Congruences – Special Divisibility Tests - Chinese Remainder Theorem- Fermat's Little Theorem – Wilson's Theorem – Residue Classes and Reduced Residue Classes – Solutions of Congruences

UNIT-III (12 hours)

Number Theory from an Algebraic Viewpoint – Multiplicative Groups, Rings and Fields

UNIT-IV (12 hours)

Quadratic Residues - Quadratic Reciprocity – The Jacobi Symbol

UNIT-V (12 hours)

Greatest Integer Function – Arithmetic Functions – The Moebius Inversion Formula

Reference Books:

1. "Introduction to the Theory of Numbers" by Niven, Zuckerman & Montgomery (John Wiley & Sons)
2. "Elementary Number Theory" by David M. Burton.
3. Elementary Number Theory, by David, M. Burton published by 2nd Edition (UBS Publishers).
4. Introduction to Theory of Numbers, by Davenport H., Higher Arithmetic published by 5th Edition (John Wiley & Sons) Niven, Zuckerman & Montgomery. (Camb, Univ, Press)
5. Number Theory by Hardy & Wright published by Oxford Univ, Press.
6. Elements of the Theory of Numbers by Dence, J. B & Dence T.P published by Academic Press.

Instruction to Paper Setter:

Two questions must be given from each unit in Part-A and Part-B2.

1. S. S. S. S. S.
2. H. C. C. C. C.
3. S. S. S. S. S.
4. S. S. S. S. S.
5-77A de

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(INSTRUCTIONS TO PAPER SETTER)
 B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS
 SEMESTER – VI, PAPER – VIII-A-1
 Cluster Elective –VIII-A-1; LAPLACE TRANSFORMS

NOTE :- Paper Setter Must select TWO Short Questions and TWO Easy Questions from Each Unit as Follows :-

| PAPER | 5 MARKS QUESTIONS | 10 MARKS QUESTIONS |
|------------|---------------------------------|---------------------------------|
| UNIT – I | 2 (Problems) | 1 (Theorem)
&
1 (Problem) |
| UNIT – II | 1 (Theorem)
&
1 (Problem) | 1 (Theorem)
&
1 (Problem) |
| UNIT – III | 2 (Problems) | 1 (Theorem)
&
1 (Problem) |
| UNIT – IV | 1 (Theorem)
&
1 (Problem) | 1 (Theorem)
&
1 (Problem) |
| UNIT – V | 2 (Problems) | 1 (Theorem)
&
1 (Problem) |

1. 3 questions
2. ~~1~~
3. 11. cl. 1000
4. 1000
- 5-710 de

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.
B.A./B.Sc. THIRD YEAR MATHEMATICS
SEMESTER - VI, PAPER - VIII-A-1
Cluster Elective -VIII-A-1; LAPLACE TRANSFORMS
MODEL QUESTION PAPER

TIME : 3 Hours

Max.Marks : 75

PART - A

I. Answer any FIVE Questions :

5 X 5 = 25M

1. Find $L\left\{e^{-t}(3\sinh 2t - 5\cosh 2t)\right\}$.

2. Find $L\{F(t)\}$ Where $F(t) = \begin{cases} 0, & 0 < t < 1 \\ t, & 1 < t < 2 \\ 0, & t > 2 \end{cases}$

3. State and prove second shifting theorem in Laplace Transforms.

4. Applying change of scale property, find $L\{\cos 5t\}$.

5. Find $L\{t(3\sin 2t - 2\cos 2t)\}$.

6. Show that $\int_0^{\alpha} t e^{-2t} \cos t dt = \frac{3}{25}$.

7. State and prove first shifting Theorem in Inverse Laplace Transforms.

8. $L^{-1}\left\{\frac{3P-2}{P^2-4P+20}\right\}$.

9. Find $L^{-1}\left\{\log \frac{P+3}{P+2}\right\}$.

10. Find $L^{-1}\left\{\frac{1}{P(P+1)^3}\right\}$.

PART - B

Answer any **FIVE** of the following Questions.

Choosing at least **ONE** Question from Each Section.

(5 × 10 = 50 Marks)

SECTION - A

UNIT - I

11. Define Laplace Transforms. State and prove linear property of Laplace Transforms.

12. Find $L\{\sin at\}$ and $L\{\cos at\}$ and hence obtain $L\{\sin^2 at\}$.

UNIT - II

13. State and prove initial value theorem.

14. Find $L\{F(t)\}$ where $F(t) = \begin{cases} \cos\left(t - \frac{2}{3}\pi\right) & , t > \frac{2\pi}{3} \\ 0 & , t < \frac{2\pi}{3} \end{cases}$

UNIT - III

15. If $L\{F(t)\} = f(p)$ then prove that $L\left\{\int_0^t F(x) dx\right\} = \frac{1}{p} L\{F(t)\}$.

16. Prove that $L\left\{\frac{\sin t}{t}\right\} = \text{Tan}^{-1} \frac{1}{P}$ and hence find $L\left\{\frac{\sin at}{t}\right\}$.

SECTION - B

UNIT - IV

17. State and prove change of scale property in Inverse Laplace Transforms.

18. Prove that $L^{-1}\left\{\frac{P}{(P^2 - 2P + 2)(P^2 + 2P + 2)}\right\} = \frac{1}{2} \sin t \sinh t$.

UNIT - V

19. State and prove Heaviside's expansion theorem.

20. Use Convolution theorem to find $L^{-1}\left\{\frac{1}{P\sqrt{P+1}}\right\}$.

Instruction to Paper Setter:

Two questions must be given from each unit in Part-A and Part-B

1. 3 questions
2. ~~1 question~~
3. 4. 10 total
4. 10
5-11 total

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE
B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS,
SEMESTER – VI, CLUSTER – A, PAPER – VIII-A-2
Cluster Elective- VIII-A-2: INTEGRAL TRANSFORMS

60 Hrs

UNIT – 1 (12 hrs) Application of Laplace Transform to solutions of Differential Equations :-

Solutions of ordinary Differential Equations.

Solutions of Differential Equations with constants co-efficient
Solutions of Differential Equations with Variable co-efficient

UNIT – 2 (12 hrs) Application of Laplace Transform :-

Solutions of partial Differential Equations.

UNIT – 3 (12 hrs) Application of Laplace Transforms to Integral Equations :-

Definitions : Integral Equations-Abel's, Integral Equation-Integral Equation of Convolution Type, Integro Differential Equations. Application of L.T. to Integral Equations.

UNIT – 4 (12 hrs) Fourier Transforms-I :-

Definition of Fourier Transform – Fourier's in Transform – Fourier cosine Transform – Linear Property of Fourier Transform – Change of Scale Property for Fourier Transform – sine Transform and cosine transform shifting property – modulation theorem.

UNIT – 5 (12 hrs) Fourier Transform-II :-

Convolution Definition – Convolution Theorem for Fourier transform – parseval's Identify – Relationship between Fourier and Laplace transforms – problems related to Integral Equations.

Prescribed Text Books :-

Integral Transforms by A.R. Vasistha and Dr. R.K. Gupta Published by Krishna Prakashan Media Pvt. Ltd. Meerut.

Reference Books :-

1. Laplace Transforms by A.R. Vasistha and Dr. R.K. Gupta Published by Krishna Prakashan Media Pvt. Ltd. Meerut.
2. Fourier Series and Integral Transforms by Dr. S. Sreenadh Published by S.Chand and Co., Pvt. Ltd., New Delhi.
3. Laplace and Fourier Transforms by Dr. J.K. Goyal and K.P. Gupta, Published by Pragathi Prakashan, Meerut.
4. Integral Transforms by M.D. Raising hania, - H.C. Saxsena and H.K. Dass Published by S. Chand and Co., Pvt.Ltd., New Delhi.

Suggested Activities:

Seminar/ Quiz/ Assignments

Instruction to Paper Setter:

Two questions must be given from each unit in Part A and Part B

1. ✓
2. ✓
3. ✓
4. ✓
5-7A ✓

BLUE PRINT OF QUESTION PAPER
(INSTRUCTIONS TO PAPER SETTER)
 B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS,
 SEMESTER – VI, CLUSTER – A, PAPER – VIII-A-2
 Cluster Elective- VIII-A-2: INTEGRAL TRANSFORMS

NOTE :- Paper Setter Must select TWO Short Questions and TWO Easy Questions from Each Unit as Follows :-

| PAPER | 5 MARKS QUESTIONS | 10 MARKS QUESTIONS |
|------------|---------------------------------|---------------------------------|
| UNIT – I | 2 (Problems) | 2 (Problems) |
| UNIT – II | 2 (Problems) | 2 (Problems) |
| UNIT – III | 2 (Problems) | 2 (Problems) |
| UNIT – IV | 1 (Theorem)
&
1 (Problem) | 1 (Theorem)
&
1 (Problem) |
| UNIT – V | 1 (Theorem)
&
1 (Problem) | 2 (Theorems) |

1. 3 questions
2. ~~1~~
3. 11. 12. 13. 14.
4. 15. 16.
- 5-7. 17. 18.

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.
B.A./B.Sc. THIRD YEAR MATHEMATICS
SEMESTER – VI, CLUSTER – A, PAPER – VIII-A-2
Cluster Elective- VIII-A-2: INTEGRAL TRANSFORMS
MODEL QUESTION PAPER

TIME : 3 Hours

Max.Marks : 75

PART – A

I. Answer any FIVE Questions :

5 X 5 = 25M

1. Solve $\frac{d^2y}{dx^2} + y = 0$.

2. $(D^2 + 2D + 1)y = 3te^{-t}$ find $L\{y\}$.

3. If $y(x, t)$ is a function of x and t prove that $L\left\{\frac{\partial y}{\partial t}\right\} = p\bar{y}(x, p) - y(x, 0)$.

4. Solve $\frac{\partial^2 y}{\partial x^2} - \frac{\partial^2 y}{\partial t^2} = xt$ when $y = 0 = \frac{\partial y}{\partial t}$ at $t = 0$ and $y(0, t) = 0$.

5. Define Abel's Integral Equation give One Example.

6. Solve $\int_0^t F(\mu)F(t-\mu)d\mu = 16\sin 4t$.

7. State and prove Linear property of Fourier Transform.

8. Find Fourier sine transform of $f(x)$

$$f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x > 1 \end{cases}$$

9. State and prove Rayleigh's theorem.

10. Solve the Integral Equation $\int_0^\alpha f(x) \cos \lambda x dx = e^{-\lambda}$.

PART - B

Answer any **FIVE** of the following Questions.

Choosing at least **ONE** Question from Each Section.

(5 × 10 = 50 Marks)

SECTION - A

UNIT - I

11. Solve $(D^2 - D - 2)y = 20\sin 2t$ if $y = -1$, $Dy = 2$ at $t = 0$.

12. Solve $y^{11} - ty^1 + y = 1$ if $y(0) = 1$, $y'(0) = 2$.

UNIT - II

13. Solve $\frac{\partial y}{\partial t} = 3 \frac{\partial^2 y}{\partial x^2}$ when $y\left(\frac{\pi}{2}, t\right) = 0$, $\left(\frac{\partial y}{\partial x}\right)_{x=0} = 0$ and $y(x, 0) = 30\cos 5x$.

14. Solve $\frac{\partial y}{\partial x} - \frac{\partial y}{\partial t} = 1 - e^{-t}$, $0 < x < 1, t > 0$ and $y(x, 0) = x$.

UNIT - III

15. Solve the integral equation $\int_0^t \frac{F(\mu)}{(t-\mu)^3} d\mu = t(1+t)$.

16. Solve $2F(t) = 2 - t + \int_0^t F(t-\mu)F(\mu) d\mu$.

SECTION - B

UNIT - IV

17. State and prove change of scale property for Fourier cosine Transform.

18. Find the Fourier Transform of $F(x) = \begin{cases} 1-x^2, & |x| \leq 1 \\ 0, & |x| \geq 1 \end{cases}$.

UNIT - V

19. State and prove Fatling theorem for Fourier Transform.

20. Derive the Relationship between Fourier and Laplace Transforms.

Instruction to Paper Setter:

Two questions must be given from each unit in Part-A and Part-B

1. 3 questions
2. 1 question
3. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20.
4. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20.
5-7/11/12

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE
B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS
SEMESTER – VI, CLUSTER-B, PAPER – VIII-B-1
Cluster Elective – VIII-B-1 : PRINCIPLES OF MECHANICS

60 Hrs

Unit – I: (10 hours)

D’Alembert’s Principle and Lagrange’s Equations : some definitions – Lagrange’s equations for a Holonomic system – Lagrange’s Equations of motion for conservative, nonholonomic system.

Unit – II: (10 hours)

Variational Principle and Lagrange’s Equations: Variational Principle – Hamilton’s Principle – Derivation of Hamilton’s Principle from Lagrange’s Equations – Derivation of Lagrange’s Equations from Hamilton’s Principle – Extension of Hamilton’s Principle – Hamilton’s Principle for Non-conservative, Non-holonomic system – Generalised Force in Dynamic System – Hamilton’s Principle for Conservative, Non-holonomic system – Lagrange’s Equations for Non-conservative, Holonomic system - Cyclic or Ignorable Coordinates.

Unit –III: (15 hours)

Conservation Theorem, Conservation of Linear Momentum in Lagrangian Formulation – Conservation of angular Momentum – conservation of Energy in Lagrangian formulation.

Unit – IV: (15 hours)

Hamilton’s Equations of Motion: Derivation of Hamilton’s Equations of motion – Routh’s procedure – equations of motion – Derivation of Hamilton’s equations from Hamilton’s Principle – Principle of Least Action – Distinction between Hamilton’s Principle and Principle of Least Action.

Unit – V: (10 hours)

Canonical Transformation: Canonical coordinates and canonical transformations – The necessary and sufficient condition for a transformation to be canonical – examples of canonical transformations – properties of canonical transformation – Lagrange’s bracket is canonical invariant – poisson’s bracket is canonical invariant - poisson’s bracket is invariant under canonical transformation – Hamilton’s Equations of motion in poisson’s bracket – Jacobi’s identity for poisson’s brackets.

Reference Text Books :

1. Classical Mechanics by C.R.Mondal Published by Prentice Hall of India, New Delhi.
2. A Text Book of Fluid Dynamics by F. Charlton Published by CBS Publications, New Delhi.
3. Classical Mechanics by Herbert Goldstein, published by Narosa Publications, New Delhi.
4. Fluid Mechanics by T. Allen and I.L. Ditsworth Published by (McGraw Hill, 1972)
5. Fundamentals of Mechanics of fluids by I.G. Currie Published by (CRC, 2002)
6. Fluid Mechanics : An Introduction to the theory, by Chia-shun Yeh Published by (McGraw Hill, 1974)
7. Introduction to Fluid Mechanics by R.W Fox, A.T Mc Donald and P.J. Pritchard Published by (John Wiley and Sons Pvt. Ltd., 2003)

Instruction to Paper Setter:

Two questions must be given from each unit in Part-A and Part-B

1. 3 questions
2. 1 question
3. 1 question
4. 1 question
5-7/10 de

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE
B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS
SEMESTER – VI, CLUSTER-B, PAPER – VIII-B-2
Cluster Elective–VIII-B-2 : FLUID MECHANICS

60 Hrs

Unit – I : (10 hours)

Kinematics of Fluids in Motion

Real fluids and Ideal fluids – Velocity of a Fluid at a point – Streamlines and pathlines – steady and Unsteady flows – the velocity potential – The Vorticity vector – Local and Particle Rates of Change – The equation of Continuity – Acceleration of a fluid – Conditions at a rigid boundary – General Analysis of fluid motion.

Unit – II : (10 hours)

Equations of motion of a fluid- Pressure at a point in fluid at rest – Pressure at a point in a moving fluid – Conditions at a boundary of two inviscid immiscible fluids – Euler's equations of motion – Bernoulli's equation – Worked examples.

Unit – III : (10 hours)

Discussion of the case of steady motion under conservative body forces - Some flows involving axial symmetry – Some special two-dimensional flows – Impulsive motion – Some further aspects of vortex motion.

Unit – IV : (15 hours)

Some Two – dimensional Flows, Meaning of two-dimensional flow – Use of Cylindrical polar coordinates – The stream function – The complex potential for two-dimensional, Irrotational, Incompressible flow – Uniform Stream – The Milne-Thomson Circle theorem – the theorem of Blasius.

Unit – V : (15 hours)

Viscous flow, Stress components in a real fluid – Relations between Cartesian components of stress – Translational motion of fluid element – The rate of strain quadric and principal stresses – Some further properties of the rate of strain quadric – Stress analysis in fluid motion – Relations between stress and rate of strain – the coefficient of viscosity and laminar flow - The Navier-Stokes equations of motion of a viscous fluid.

Reference Text Books :

1. A Text Book of Fluid Dynamics by F. Charlton Published by CBS Publications, New Delhi.
2. Classical Mechanics by Herbert Goldstein, published by Narosa Publications, New Delhi.
3. Fluid Mechanics by T. Allen and I.L. Ditsworth published by (McGraw Hill, 1972)
4. Fundamentals of Mechanics of fluids by I.G. Currie published by (CRC, 2002)
5. Fluid Mechanics, An Introduction to the theory by Chia-shun Yeh published by (McGraw Hill, 1974)
6. Fluids Mechanics by F.M White published by (McGraw Hill, 2003)
7. Introduction to Fluid Mechanics by R.W Fox, A.T Mc Donald and P.J. Pritchard published by (John Wiley and Sons Pvt. Ltd., 2003)

Instruction to Paper Setter:

Two questions must be given from each unit in Part-A and Part-B

1. 3 questions
2. 1 question
3. 11. cl. clal
4. 3 lines
5-7/10 cl

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE
B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS

SEMESTER – VI, CLUSTER-C, PAPER – VIII-C-1 Cluster Elective–VIII-C-1:
GRAPH THEORY

60 Hrs

UNIT – I (12 hrs) Graphs and Sub Graphs :

Graphs , Simple graph, graph isomorphism, the incidence and adjacency matrices, sub graphs, vertex degree, Hand shaking theorem, paths and connection, cycles.

UNIT – II (12 hrs)

Applications, the shortest path problem, Sperner"s lemma.

Trees :

Trees, cut edges and Bonds, cut vertices, Cayley"s formula.

UNIT – III (12 hrs) :

Applications of Trees - the connector problem.

Connectivity

Connectivity, Blocks and Applications, construction of reliable communication Networks,

UNIT – IV (12 hrs):

Euler tours and Hamilton cycles

Euler tours, Euler Trail, Hamilton path, Hamilton cycles , dodecahedron graph, Petersen graph, hamiltonian graph, closure of a graph.

UNIT – V (12 hrs)

Applications of Eulerian graphs, the Chinese postman problem, Fleury"s algorithm - the travelling salesman problem.

Reference Books :

1. Graph theory with Applications by J.A. Bondy and U.S.R. Murthy published by Mac. Millan Press
2. Introduction to Graph theory by S. Arumugham and S. Ramachandran, published by scitech Publications, Chennai-17.
3. A Text Book of Discrete Mathamatics by Dr. Swapan Kumar Sankar, published by S.Chand & Co. Publishers, New Delhi.
4. Graph theory and combinations by H.S. Govinda Rao published by Galgotia Publications.

Instruction to Paper Setter:

Two questions must be given from each unit in Part-A and Part-B.

1. 3 questions
2. 1 question
3. 11. cl. cl. cl.
4. 11. cl. cl.
5-7. 11. cl.

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE
B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS

SEMESTER – VI, CLUSTER-C, PAPER – VIII-C-2 Cluster Elective -VIII-C-2:
APPLIED GRAPH THEORY

60 Hrs

UNIT – I (12 hrs) : Matchings

Matchings – Alternating Path, Augmenting Path - Matchings and coverings in Bipartite graphs, Marriage Theorem, Minimum Coverings.

UNIT –II (12 hrs) :

Perfect matchings, Tutte"s Theorem, Applications, The personal Assignment problem -The optimal Assignment problem, Kuhn-Munkres Theorem.

UNIT –III (12 hrs) : Edge Colorings

Edge Chromatic Number, Edge Coloring in Bipartite Graphs - Vizing"s theorem.

UNIT –IV (12 hrs) :

Applications of Matchings, The timetabling problem.

Independent sets and Cliques

Independent sets, Covering number , Edge Independence Number, Edge Covering Number - Ramsey"s theorem.

UNIT –V (12 hrs) :

Determination of Ramsey"s Numbers – Erdos Theorem, Turan"s theorem and Applications, Sehur"s theorem. A Geometry problem.

Reference Books :-

1. Graph theory with Applications by J.A. Bondy and U.S.R. Murthy, published by Mac. Millan Press.
2. Introduction to graph theory by S. Arumugham and S. Ramachandran published by SciTech publications, Chennai-17.
3. A text book of Discrete Mathematics by Dr. Swapan Kumar Sarkar, published by S. Chand Publishers.
4. Graph theory and combinations by H.S. Govinda Rao, published by Galgotia Publications.

Instruction to Paper Setter:

Two questions must be given from each unit in Part-A and Part-B

1. 3 questions
2. 1 question
3. U. C. Chak
4. 3 questions
5-7/10 de

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE
B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS
SEMESTER – VI, PAPER – VIII-(D)-1
Cluster Elective –VIII-(D)-1; NUMERICAL ANALYSIS

60 Hrs

UNIT- I: (10 hours)

Errors in Numerical computations : Errors and their Accuracy, Mathematical Preliminaries, Errors and their Analysis, Absolute, Relative and Percentage Errors, A general error formula, Error in a series approximation.

UNIT – II: (12 hours)

Solution of Algebraic and Transcendental Equations: The bisection method, The iteration method, The method of false position, Newton Raphson method, Generalized Newton Raphson method. Muller's Method

UNIT – III: (12 hours) Interpolation - I

Interpolation : Errors in polynomial interpolation, Finite Differences, Forward differences, Backward differences, Central Differences, Symbolic relations, Detection of errors by use of Differences Tables, Differences of a polynomial

UNIT – IV: (12 hours) Interpolation - II

Newton's formulae for interpolation. Central Difference Interpolation Formulae, Gauss's central difference formulae, Stirling's central difference formula, Bessel's Formula, Everett's Formula.

UNIT – V: (14 hours) Interpolation - III

Interpolation with unevenly spaced points, Lagrange's formula, Error in Lagrange's formula, Divided differences and their properties, Relation between divided differences and forward differences, Relation between divided differences and backward differences Relation between divided differences and central differences, Newton's general interpolation Formula, Inverse interpolation.

Reference Books :

1. Numerical Analysis by S.S.Sastry, published by Prentice Hall of India Pvt. Ltd., New Delhi. (Latest Edition)
2. Numerical Analysis by G. Sankar Rao published by New Age International Publishers, New – Hyderabad.
3. Finite Differences and Numerical Analysis by H.C Saxena published by S. Chand and Company, Pvt. Ltd., New Delhi.
4. Numerical methods for scientific and engineering computation by M.K.Jain, S.R.K.Iyengar, R.K. Jain.

Suggested Activities: Seminar/ Quiz/ Assignments

Instruction to Paper Setter:

Two questions must be given from each unit in Part-A and Part-B

1. S. Sastry
2. G. Sankar Rao
3. H.C. Saxena
4. M.K. Jain, S.R.K. Iyengar, R.K. Jain
5-771 de

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.

B.A./B.Sc. THIRD YEAR MATHEMATICS

SEMESTER - VI, PAPER - VIII-(D)-1

Cluster Elective -VIII-(D)-1; NUMERICAL ANALYSIS

MODEL QUESTION PAPER

TIME : 3 Hours

Max.Marks : 75

PART - A

I. Answer any FIVE Questions :

5 X 5 = 25M

1. Define the following (a) Absolute Error (b) Relative Error (c) Percentage Error.
2. If $y = 4x^6 - 5x$ find percentage error in y at $x=1$ if the error in x is 0.04.
3. Find the root of the equation $2x - \log_{10}^x = 7$. Which lies between 3.5 and 4 by Regular Falsi Method.
4. Explain merits and demerits of Newton - Raphson Method.
5. Prove the following (a) $E\nabla = \Delta = \nabla E$ (b) $\nabla = 1 - E^{-1}$.
6. Find the Missing form :

| | | | | | |
|----------|----------|----------|----------|----------|----------|
| x | 0 | 1 | 2 | 3 | 4 |
| y | 1 | 3 | 9 | - | 8 |
7. Find cubic polynomial $y(0)=1, y(1)=0, y(2)=1, y(3)=10$. Hence or other wise find $y(4)$.
8. $y_{20} = 24, y_{24} = 32, y_{28} = 35, y_{32} = 40$, find y_{25} by Bessel's Formula.
9. Derive the relation between divided Difference and Backward Differences.
10. Derive Lagrange's Interpolation Formula.

PART - B

Answer any **FIVE** of the following Questions.

Choosing at least **ONE** Question from Each Section.

(5 × 10 = 50 Marks)

SECTION - A

UNIT - I

11. Define the types of errors and Establish a general error formulas by taking $\mu = f(x_1, x_2, \dots, x_n)$.
12. Given $a = 10 \pm 0.05, b = 0.0356 \pm 0.0002, c = 15300 \pm 100, d = 62000 \pm 500$. Find the maximum absolute error in $a + b + c + d, a + 5c - d$.

UNIT - II

13. Explain Bisection method to find a real root of the equation $f(x) = 0$.
14. Explain Muller's method to find root of $f(x) = 0$ by Muller's method find root of the equation $x^3 - x^2 - x - 1 = 0$

UNIT - III

15. If $f(x)$ is a polynomial of degree 'n' and the values of x are equally spaced then prove that $\Delta^n f(x)$ is a constant.
16. Evaluate the following taking interval as 1 using finite deference method :
- (a) $\Delta \tan^{-1} x$ (b) $2x/x!$ (c) Δe^x .

SECTION - B

UNIT - IV

17. Derive Gauss's Backward Interpolation Formula.
18. Using sterling formula find $y_{28}, y_{20} = 49225, y_{25} = 48316, y_{30} = 47236,$
 $y_{35} = 45926, y_{40} = 44306.$

UNIT - V

19. Find the interpolation polynomial for the following using Lagrange's Method :
- | | | | | |
|---|---|---|----|-----|
| x | 0 | 1 | 2 | 5 |
| y | 2 | 3 | 12 | 147 |
20. Derive Newton's general interpolation formula with divided difference.

Instruction to Paper Setter:

Two questions must be given from each unit in Part-A and Part-B

1. 3 questions
2. ~~1 question~~
3. u. cl. eval
4. skip
5-7/10 de

VIKRAMA SIMHAPURI UNIVERSITY::NELLORE
B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS
SEMESTER – VI: PAPER – VIII-D-2
Cluster Elective –VIII-D-2: ADVANCED NUMERICAL ANALYSIS

60 Hrs

Unit – I (10 Hours)

Curve Fitting: Least – Squares curve fitting procedures, fitting a straight line, nonlinear curve fitting, Curve fitting by a sum of exponentials.

UNIT- II : (12 hours)

Numerical Differentiation: Derivatives using Newton's forward difference formula, Newton's backward difference formula, Derivatives using central difference formula, Stirling's interpolation formula, Newton's divided difference formula, Maximum and minimum values of a tabulated function.

UNIT- III : (12 hours)

Numerical Integration: General quadrature formula on errors, Trapezoidal rule, Simpson's 1/3 – rule, Simpson's 3/8 – rule, and Weddle's rules, Euler – Maclaurin Formula of summation and quadrature, The Euler transformation.

UNIT – IV: (14 hours)

Solutions of simultaneous Linear Systems of Equations: Solution of linear systems – Direct methods, Matrix inversion method, Gaussian elimination methods, Gauss-Jordan Method, Method of factorization, Solution of Tridiagonal Systems, Iterative methods. Jacobi's method, Gauss-siedal method.

UNIT – V (12 Hours)

Numerical solution of ordinary differential equations: Introduction, Solution by Taylor's Series, Picard's method of successive approximations, Euler's method, Modified Euler's method, Runge – Kutta methods.

Reference Books :

1. Numerical Analysis by S.S.Sastry, published by Prentice Hall India (Latest Edition).
2. Numerical Analysis by G. Sankar Rao, published by New Age International Publishers, New – Hyderabad.
3. Finite Differences and Numerical Analysis by H.C Saxena published by S. Chand and Company, Pvt. Ltd., New Delhi.
4. Numerical methods for scientific and engineering computation by M.K.Jain, S.R.K.Iyengar, R.K. Jain.

Suggested Activities:

Seminar/ Quiz/ Assignments

Instruction to Paper Setter:

Two questions must be given from each unit in Part-A and Part-B

1. Sankar Rao
2. H. C. Saxena
3. Jain
4. Jain
5-770 de

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.
B.A./B.Sc. THIRD YEAR MATHEMATICS
SEMESTER – VI: PAPER – VIII-D-2
Cluster Elective –VIII-D-2: ADVANCED NUMERICAL ANALYSIS
MODEL QUESTION PAPER

TIME : 3 Hours

Max.Marks : 75

PART – A

I. Answer any FIVE Questions :

5 X 5 = 25M

1. Fitting a second degree parabola by the method of Least-Squares.
2. Fit a exponential curve $y = ab^x$.
3. Find first two Derivatives using Newton's backward difference formula.
4. Find the first and second derivatives of the function tabulated below at $x = 15$

| | | | | | | |
|---|-------|---|--------|----|--------|----|
| x | 1.5 | 2 | 2.5 | 3 | 3.5 | 4 |
| y | 3.325 | 7 | 13.625 | 24 | 38.875 | 59 |
5. Derive Trapezoidal Rule.
6. Evaluate $\int_0^1 e^x dx$ using Simpson's $\frac{1}{3}$ rd method.
7. Solve by matrix inverse method $x + y - 2z = 3$, $2x - y + z = 0$, $3x + y - z = 8$.
8. Explain Gaussian Elimination method .
9. Explain Taylor's Method.
10. Explain modified Euler Method.

PART - B

Answer any **FIVE** of the following Questions.

Choosing at least **ONE** Question from Each Section.

(5 × 10 = 50 Marks)

SECTION - A

UNIT - I

11. Fit an exponential curve of second kind $y = ae^{bx}$.
12. Fit a straight line to the following data :
- | | | | | | | |
|---|----|----|----|----|----|----|
| x | 0 | 5 | 10 | 15 | 20 | 25 |
| y | 12 | 15 | 17 | 22 | 24 | 30 |
- and estimate y value when x = 30.

UNIT - II

13. From the Stirling's interpolation formula obtain the following approximation up to 3rd difference.

$$\frac{d}{dy}(yx) = \frac{2}{3}(y_{x+1} - y_{x-1}) - \frac{1}{12}(y_{x+2} - y_{x-2}).$$

14. From the following table find the value of x for which y is maximum and find this value of y

| | | | | | |
|---|--------|--------|--------|--------|-------|
| x | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 |
| y | 0.9320 | 0.9636 | 0.9055 | 0.9985 | 0.999 |

UNIT - III

15. Derive newton's cote's Quadrature formula.

16. Evaluate $\int_4^{5.2} \log x dx$ using Weddle's Rule.

SECTION - B

UNIT - IV

17. Solve by Tridiagonal system
 $x_1 + 2x_2 = 7, x_1 - 3x_2 - x_3 = 4, 4x_2 + 3x_3 = 5.$
18. Solve by Jacobi's method $10x + 2y + z = 9, x + 10y - z = -22, -2x + 3y + 10z = 22.$

UNIT - V

19. Compute y at $x = 0.25$ by Euler's method given $y' = 2xy, y(0) = 1:$
20. Using Runge - Kutta methods of second order, compute $y(2.5)$ prove

$$\frac{dy}{dx} = \frac{x+y}{x}, y(2) = 2 \text{ falling } h = 0.25.$$

Instruction to Paper Setter:

Two questions must be given from each unit in Part-A and Part-B

1. 3 questions
2. 1 question
3. 11. 12. 13. 14. 15.
4. 16. 17. 18. 19. 20.
5-7/11/12

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.

PHYSICS ELECTIVE

Paper-VII-(A) Elective (Electronics) Semester -VI

Elective Paper -VII-(A):Analog and Digital Electronics

No. of Hours per week : 04

Total Lectures:60

Unit-I (14 Hours)

1. FET-Construction, Working, characteristics and uses; MOSFET-enhancement MOSFET, depletion MOSFET, construction and working , drain characteristics of MOSFET
2. Photo electric devices : Einstein's photo electric equation, Photo diode, Photo transistor, Structure and operation of LDR, applications of LDR.

Unit-II (10Hours)

3. Operational Amplifiers: Characteristics of ideal and practical Op-Amp (IC 741), Basic differential amplifiers, Op-Amp supply voltage, IC identification, Op-Amp parameters : off set voltages and currents, CMRR, slew rate, concept of virtual ground.

Unit-III (10 Hours)

4. Applications of Op-Amp: Op-Amp as an Inverting amplifier, Non-inverting amplifier, voltage follower, summing amplifier, comparator, integrator, differentiator.

Unit-IV(14 Hours)

5. Data processing circuits: Multiplexers (2X1, 4X1), De-multiplexers (1X2, 1X4), encoders (4X2, 8X3), decoders (2X4, 3X8).
6. Characteristics for Digital ICs -RTL, DTL, TTL, ECL CMOS (NAND & NOR Gates).

Unit-V (12 Hours)

7. Sequential digital circuits:Flip-flops, RS, Clocked SR, JK, D, T, Master-Slave .Flip- flop
8. Code Converters: Design of code converter:, binary/BCD to gray, gray to binary/BCD .

Reference Books

1. Digital Electronics by G.K.Kharate Oxford University Press
2. Unified Electronics by Agarwal and Agarwal.
3. Op- Amp and Linear ICs by Ramakanth A Gayekwad, 4th edition PHI
4. Digital Principles and Applications by Malvino and Leach, TMH, 1996, 4th edition.
5. Digital Circuit design by Morris Mano,PHI
6. Switching Theory and Logic design by A.AnandKumar ,PHI
7. operations amplifier by SV Subramanyam.

Elective Paper-VII Practical: Analog and Digital Electronics

2hrs/Week

Minimum of 6 experiments to be done and recorded

- 1) Characteristics of FET
- 2) Characteristics of MOSFET
- 3) Characteristics of LDR
- 4) Characteristics of Op-amp.(IC741)
- 5) Op-Amp as an inverting amplifier
- 6) Op-Amp as integrator/differentiator
- 7) Op-Amp as summing amplifier/difference amplifier
- 8) R - S flip-flop
- 9) JK flip-flop
- 10) Op-Amp as a Non inverting amplifier.
- 11) Op-Amp as an Astable Multivibrator.
- 12) Designing of 4-bit Binary to Gray code converter.

Paper VII-(B) Elective (Materials Science)
Semester –VI
Elective Paper –VII-(B): Materials Science

No. of Hours per week: 04

Total Lectures:60

UNIT-I (12 hrs)

1. **Materials and Crystal Bonding:** Materials, Classification, Crystalline, Amorphous, Glasses; Metals, Alloys, Semiconductors, Polymers, Ceramics, Plastics, Bio-materials, Composites, Bulk and nanomaterials. Review of atomic structure – Interatomic forces – Different types of chemical bonds – Ionic-covalent bond or homopolar bond – Metallic bond – Dispersion bond – Dipole bond – Hydrogen bond – Binding energy of a crystal.

UNIT-II (12 hrs)

2. Defects and Diffusion in Materials: Introduction – Types of defects - Point defects- Line defects- Surface defects- Volume defects- Production and removal of defects- Deformation- irradiation- quenching- annealing- recovery - recrystallization and grain growth. Diffusion in solids- Fick's laws of diffusion.

UNIT-III(12 hrs)

3. Mechanical Behavior of Materials: Different mechanical properties of engineering materials – Creep – Fracture – Technological properties – Factors affecting mechanical properties of a material – Heat treatment - Cold and hot working – Types of mechanical tests – Metal forming process – Powder – Misaligning – Deformation of metals.

UNIT-IV (12 hrs)

4. Magnetic Materials: Dia-, Para-, Ferri- and Ferromagnetic materials, Classical Langevin theory of dia magnetism, Quantum mechanical treatment of paramagnetism. Curie's law, Weiss's theory of ferromagnetism, Ferromagnetic domains. Discussion of B-H Curve. Hysteresis and energy Loss.

UNIT-V (12 hrs)

5. Dielectric Materials: Dielectric constant, dielectric strength and dielectric loss, polarizability, mechanism of polarization, factors affecting polarization, polarization curve and hysteresis loop, types of dielectric materials, applications; ferroelectric, piezoelectric and pyroelectric materials, Clausius -Mosotti equation.

Reference books

1. Materials Science by M.Arumugam, Anuradha Publishers. 1990, Kumbakonam.
2. Materials Science and Engineering V.Raghavan, Printice Hall India Ed. V 2004. New Delhi.
3. Elementary Solid State Physics, 1/e M. Ali Omar, 1999, Pearson India
4. Solid State Physics, M.A. Wahab, 2011, Narosa Publications

Elective Paper-VII-B Practical: Materials Science

2hrs/Week

Minimum of 6 experiments to be done and recorded

1. Measurement of susceptibility of paramagnetic solution (Quinck's Tube Method)
2. Measurement of magnetic susceptibility of solids.
3. Determination of coupling coefficient of a piezoelectric crystal.
4. Measurement of the dielectric constant of a dielectric Materials
5. Study the complex dielectric constant and plasma frequency of metal using surface plasmon resonance (SPR)
7. Study the hysteresis loop of a Ferroelectric Crystal.
8. Study the B-H curve of 'Fe' using solenoid and determine energy loss from hysteresis.

Paper-VII-(C) Elective (Renewable Energy)

Semester –VI

Elective Paper –VII-C: Renewable Energy

No. of Hours per week: 04

Total Lectures:60

UNIT-I (12 hrs)

1. Introduction to Energy: Definition and units of energy, power, Forms of energy, Conservation of energy, second law of thermodynamics, Energy flow diagram to the earth. Origin and time scale of fossil fuels, Conventional energy sources, Role of energy in economic development and social transformation.

2. Environmental Effects: Environmental degradation due to energy production and utilization, air and water pollution, depletion of ozone layer, global warming, biological damage due to environmental degradation. Effect of pollution due to thermal power station, nuclear power generation, hydroelectric power stations on ecology and environment.

UNIT-II (12 hrs)

3. Global Energy Scenario: Energy consumption in various sectors, projected energy consumption for the next century, exponential increase in energy consumption, energy resources, coal, oil, natural gas, nuclear and hydroelectric power, impact of exponential rise in energy usage on global economy.

4. Indian Energy Scene: Energy resources available in India, urban and rural energy consumption, energy consumption pattern and its variation as a function of time, nuclear energy - promise and future, energy as a factor limiting growth, need for use of new and renewable energy sources.

UNIT-III (12 hrs)

5. Solar energy: Solar energy, Spectral distribution of radiation, Flat plate collector, solar water heating system, Applications, Solar cooker. Solar cell, Types of solar cells, Solar module and array, Components of PV system, Applications of solar PV systems.

6. Wind Energy: Introduction, Principle of wind energy conversion, Components of wind turbines, Operation and characteristics of a wind turbine, Advantages and disadvantages of wind mills, Applications of wind energy.

UNIT-IV (12 hrs)

7. Ocean Energy: Introduction, Principle of ocean thermal energy conversion, Tidal power generation, Tidal energy technologies, Energy from waves, Wave energy conversion, Wave energy technologies, advantages and disadvantages.

8. Hydrogen Energy: History of hydrogen energy - Hydrogen production methods - Electrolysis of water, Hydrogen storage options – Compressed and liquefied gas tanks, Metal hydrides; Hydrogen safety - Problems of hydrogen transport and distribution - Uses of hydrogen as fuel.

UNIT-V (12 hrs)

9. Bio-Energy

Energy from biomass – Sources of biomass – Different species – Conversion of biomass into fuels – Energy through fermentation – Pyrolysis, gasification and combustion – Aerobic and anaerobic bio-conversion – Properties of biomass – Biogas plants – Types of plants – Design and operation – Properties and characteristics of biogas.

References :

1. Solar Energy Principles, Thermal Collection & Storage, S.P.Sukhatme: Tata McGraw Hill Pub., New Delhi.
2. Non-Conventional Energy Sources, G.D.Rai, New Delhi.
3. Renewable Energy, power for a sustainable future, Godfrey Boyle, 2004,
4. The Generation of electricity by wind, E.W. Golding.
5. Hydrogen and Fuel Cells: A comprehensive guide, Rebecca Busby, Pennwell corporation (2005)
6. Hydrogen and Fuel Cells: Emerging Technologies and Applications, B.Sorensen, Academic Press (2012).
7. Non-Conventional Energy Resources by B.H. Khan, Tata McGraw Hill Pub., 2009.
8. Fundamentals of Renewable Energy Resources by G.N.Tiwari, M.K.Ghosal, Narosa Pub., 2007.

Elective Paper-VII-C: Practical: Renewable Energy

2hrs/Week

Minimum of 6 experiments to be done and recorded

1. Preparation of copper oxide selective surface by chemical conversion method.
2. Performance testing of solar cooker.
3. Determination of solar constant using pyrheliometer.
4. Measurement of I-V characteristics of solar cell.
5. Study the effect of input light intensity on the performance of solar cell.
6. Study the characteristics of wind.

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.

**THREE YEAR B.Sc DEGREE EXAMINATION
SEMESTER-VI :: SUB : PHYSICS (WITH MATHS)
PAPER-VII(C) : RENEWABLE ENERGY
MODEL PAPER**

Time: 3 Hours

Max. Marks : 75

SECTION -A

Answer any FIVE of the following Questions : (5 X 10 = 50Marks)

1. Explain the role of energy in economic development and social transformation.
2. Explain the process of nuclear power generation. What are the effects of nuclear power plants on environment.
3. Explain the conventional energy resources.
4. Write the need for use of non-conventional energy sources for sustained development.
5. Explain the working of solar water heating systems.
6. What are the components of wind turbines? Discuss its operation.
7. Explain tidal power generation and tidal energy technologies.
8. Write about hydrogen production method. What are the problems of hydrogen transport.
9. Explain the process of conversion of bio-mass into fuel.
10. Classify the types of bio-gas plants, their design and operation.

SECTION - B

Answer any FIVE of the following questions : (5 X 5 = 25 Marks)

11. Define energy and power. Write the different forms of energy.
12. Write a short note on global warming.
13. Explain the impact, if exponential rise in energy usage on global economy.
14. Write a short note on energy consumption in urban and rural areas in India.
15. Write the applications of solar photo voltaic system.
16. What are the advantages and disadvantages of wind mills.
17. Explain the principle of ocean thermal energy conversion.
18. Write the methods of hydrogen storage.
19. What are the main sources of bio-mass.
20. Write the properties and characteristics of bio-gas.

Instruction to Paper Setter :

Two questions must be given from each UNIT in Section-A and Section-B

Semester –VI :: Cluster Electives VIII-A

Paper – VIII-A-1: Introduction to Microprocessors and Microcontrollers

No. of Hours per week: 04

Total Lectures:60

Unit – I (10Hours)

1. Introduction to microcontrollers:General purpose of computer systems,architecture of embedded system, classification, applications and purposes, challenges and designs, operational and non operational quality attributes, elemental description of embedded processors and micro controllers

Unit –II (10Hours)

2. Microprocessors:Organisation of microprocessorbased system, 8085 microprocessor,its pin diagram and architecture, concept of data bus, and address bus, 8085 programming, instruction classification, stacks and its implementation, hardware and software interrupts.

Unit– III (15Hours)

3. 8051 microcontroller:Introduction , block diagram, assembly language programming, programme counter, ROM memory, data types and directives, flag bits PSW register, jump, loop and call constructions

4. 8051 I/O Programming: Introduction to I/O port programming, pin out diagram, I/O port pin programming, bit manipulation, addressing modes, accessing memory, arithmetic and logic instructions.

Unit – IV (13 Hours)

5. Timers:Programming of 8051 timers, counter programming, interrupts, externalhardware interrupts, serial communication interrupts, interrupt priority.

6. Embedded system programming:Structure of programming, infinite loop, compiling, linking locating, down loading and debugging.

Unit –V (12Hours)

7. Embedded system design and development:Embedded system development environment, file type generated after cross compilation, disassembler, decompiler, simulator, emulator and debugging.

8. Embedded product life cycle:Embedded product development life cycle, trends in embedded industry.

Reference Books

- 1)Embedded Systems.. Architecture,programming and design, R Kamal, 2008, TMH
- 2) The 8051 micro controller and embedded systems using Assembly and C, M.A.Mazidi, J.G.Mazidi and R.D.McKinlay, second Ed., 2007 pearson Education India
- 3) Introduction to embedded systems K.V. Shibu, 1st edition, 2009 McGraw Hill
- 4) Micro Controllers in practice, I Susnea and Mitescu,2005, springer

**Elective Paper-VIII-A-1 Practical : Introduction to Microprocessors and Microcontrollers
2hrs/Week**

Minimum of 6 experiments to be done and recorded

1. To find that the given numbers is prime or not.
2. To find the factorial of a number.
3. Write a program to make the two numbers equal by increasing the smallest number and decreasing the largest number.
4. Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's.
5. Program to glow first four LED then next four using TIMER application.
6. Program to rotate the contents of the accumulator first right and then left.
7. Program to run a countdown from 9-0 in the seven segment LED display.
8. To interface seven segment LED display with 8051 microcontroller and display 'HELP' in the seven segment LED display.
9. To toggle '1234' as '1324' in the seven segment LED.
10. Interface stepper motor with 8051 and write a program to move the motor through a given angle in clock wise or counter clockwise direction.
11. Application of embedded systems: Temperature measurement, some information on LCD display, interfacing a keyboard.

Semester –VI

Cluster Elective Paper VIII-A-2: Computational Physics and Programming

No. of Hours per week: 04

Total Lectures:60

UNIT-I (12hrs)

1. Fundamentals of C language: C character set-Identifiers and Keywords-Constants -Variables-Data types-Declarations of variables-Declaration of storage class-Defining symbolic constants-Assignment statement.
2. Operators: Arithmetic operators-Relational operators-Logic operators-Assignment operators-Increment and decrement operators-Conditional operators.

UNIT-II (12hrs)

3. Expressions and I/O Statements: Arithmetic expressions-Precedence of arithmetic operators-Type converters in expressions-Mathematical (Library) functions - Data input and output-The getchar and putchar functions-Scanf-Printf simple programs.
4. Control statements:If -Else statements -Switch statements - The operators - GO TO - While, Do - While, FOR statements - BREAK and CONTINUE statements.

UNIT-III (12hrs)

5. Arrays: One dimensional and two dimensional arrays - Initialization - Type declaration - Inputting and outputting of data for arrays - Programs of matrices addition, subtraction and multiplication
6. User defined functions: The form of C functions - Return values and their types - Calling a function - Category of functions. Nesting of functions.Recursion.ANSI C functions- Function declaration. Scope and life time of variables in functions.

UNIT-IV (12hrs)

7. Linear and Non - Linear equations: Solution of Algebra and transcendental equations-Bisection, Falsi position and Newton-Rhapson methods-Basic principles-Formulae-algorithms
8. Simultaneous equations: Solutions of simultaneous linear equations-Guass elimination and Gauss Seidel iterative methods-Basic principles-Formulae – Algorithms.

UNIT-V (12hrs)

9. Interpolations: Concept of linear interpolation-Finite differences-Newton's and Lagrange's interpolation formulae-principles and Algorithms
10. Numerical differentiation and integration: Numerical differentiation-algorithm for evaluation of first order derivatives using formulae based on Taylor's series-Numerical integration-Trapezoidal and Simpson's 1/3 rule- Formulae-Algorithms.

Reference books:

1. Introductory methods of Numerical Analysis: Sastry
2. Numerical Methods: Balaguruswamy
3. Programming in ANSI C (TMH) : Balaguruswamy
4. Programming with 'C'- Byron Gottfried, Tata Mc Graw Hill

Elective Paper VIII-A-2: Practical: Computational Physics and Programming

2hrs/Week

Minimum of 6 experiments to be done and recorded

1. Write a program that reads an alphabet from keyboard and display in the reverse order.
2. Write a program to read and display multiplication of tables.
3. Write a program for converting centigrade to Fahrenheit temperature and Fahrenheit temperature centigrade.
4. Write a program to find the largest element in an array.
5. Write a program based on percentage calculation, the grade by entering the subject marks. (If percentage > 60 I class, if percentage between 50&60 II class, if percentage between 35&50 III class, if percentage below 35 fail).
6. Write a program for generation of even and odd numbers up to 100 using while, do-while and for loop.
7. Write a program to solve the quadratic equation using Bisection method.
8. Write a program for integration of function using Trapezoidal rule.
9. Write a program for solving the differential equation using Simpson's 1/3rd rule.

Semester –VI

Cluster Elective Paper –VIII-A-3 :Electronic Instrumentation

No. of Hours per week: 04

Total Lectures:60

Unit – I (12Hours)

1. Basic of measurements: Instruments accuracy , precision , sensitivity , resolution range, errors in measurement, Multimeter , principles of measurement of dc voltage and dc currents, ac current and resistance, specifications of multimeter and their significance.

Unit -11 (10 Hours)

2. Electronic Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity, principles of voltage measurement (block diagram only), specification of an electronic voltmeter/multimeter and their significance.

Unit– III (14 Hours)

3. CRO :Block diagram of basic CRO, construction of CRT, electron gun, electrostatic focusing and acceleration(only explanation) , time base operation, synchronization, front panel controls, specifications of CRO and their significance.

Applications CRO: Measurement of voltage ,dc and ac frequency , time period, special features of dual trace, digital storage oscilloscope, block diagram and principle of working.

Unit – IV (12 Hours)

4. Digital Multimeter:Block diagram,working, frequency and period measurement using universal counter, frequency counter ,accuracy and resolution.

5. Digital instruments:Principle and working of digital instruments, characteristics of a digital meter, working principle of digital voltmeter.

Unit – V (12 Hours)

6. Signal generators:Block diagram explanation, specifications of low frequency signal generators, pulse generator, function generator-working, Brief idea for testing, specifications. Distortion factor meter, wave analysis.

7. Bridges:Block diagram, working of basic LCR bridge – specifications – block diagram and working.

Reference Books

1. A text book in electrical technology by B.L.Thereja (S.Chand&Co)
2. Digital circuits and systems by Venugopal 2011 (Tata Mcgraw Hill)
3. Digital Electronics by SubrathaGhoshal 2012 (Cengage Learning)

Elective Paper-VIII-A-3: Practical: Electronic Instrumentation

2hrs/Week

Minimum of 6 experiments to be done and recorded

1. Study the loading effect of a multimeter by measuring voltage across low and high resistance.
2. Study the limitations of a multimeter for measuring high frequency voltage and currents.
3. Measurement of voltage, frequency, time period and phase angle using CRO.
4. Measurement of time period and frequency using universal counter/frequency counter.
5. Measurement of rise, fall and delay times using a CRO.
6. Measurement of distortion of a RF signal generator using distortion factor meter.
7. Measurement of R, L and C using a LCR bridge/ universal bridge.

Semester –VI :Cluster Electives – VIII-B
Cluster Elective Paper VIII-B-1 :Fundamentals of Nanoscience

No. of Hours per week: 04

Total Lectures:60

UNIT-I (12hrs)

1. Background and history: Emergence of Nanoscience with special reference to Feynman and Drexler; Role of particle size; Spatial and temporal scale; Concept of confinement, strong and weak confinement with suitable example; Development of quantum structures, Basic concept of quantum well, quantum wire and quantum dot.

Finite size Zero, One and Two Dimensional Nanostructures, Concept of Surface and Interfacial Energies. Physics of the solid state – size dependence of properties, crystal structures, Lattice vibrations, Energy bands:- Insulators Semiconductors and conductors.

UNIT-II (12hrs)

2. Classification of Nanomaterials: Inorganic nanomaterials: carbon nanotubes and cones, Organic nanomaterials: dendrimers, micelles, liposomes, block copolymers; Bionanomaterials: Biomimetic, bioceramic and nanotherapeutics; Nanomaterials for molecular electronics and optoelectronics.

UNIT-III (12hrs)

3. Macromolecules: Classification of polymers, chemistry of polymerization, chain polymerization, step polymerization, coordination polymerization. Molecular weight of polymers-number average and weight average molecular weight, degree of polymerization, determination of molecular weight of polymers by viscometry, Osmometry and light scattering methods. Kinetics of free radical polymerization, derivation of rate law. Preparation and application of polyethylene, PVC, Teflon.

UNIT-IV (12hrs)

4. Molecular & Nanoelectronics: Semiconductors, Transition from crystal technology to nanotechnology. Tiny motors, Gyroscopes and accelerometers. Nano particle embedded wrinkle resistant cloth, Transparent Zinc Oxide sun screens. Bio-systems, Nanoscale processes in environment. Nanoscale structures, Novel phenomena and Quantum control and quantum computing. Single electron transistors, Quantum dots, Quantum wires.

UNIT-V (12hrs)

5. Biomaterials: Implant materials: Stainless steels and its alloys, Ti and Ti based alloys, Ceramic implant materials; Hydroxyapatite glass ceramics, Carbon Implant materials, Polymeric Implant materials, Soft tissue replacement implants, Sutures, Surgical tapes and adhesives, heart valve implants, Artificial organs, Hard Tissue replacement Implants, Internal Fracture Fixation Devices, Wires, Pins, and Screws, Fracture Plates.

Reference Books

1. T. Pradeep: Textbook of Nanoscience and Nanotechnology Chapter (McGraw-Hill Professional, 2012), Access Engineering.
2. C. N. R. Rao, A. Müller, A. K. Cheetham, "The Chemistry of Nanomaterials :Synthesis, Properties and Applications", Wiley-VCH, 2006.
3. C. Breachignac P. Houdy M. Lahmani, "Nanomaterials and Nanochemistry", Springer, 2006.
4. Guozhong Cao, "Nanostructures and Nanomaterials: Synthesis, Properties, and Applications", World Scientific Publishing Private, Ltd., 2011.
5. Zhong Lin Wang, "Characterization of Nanophase Materials", Wiley-VCH, 2004.
6. Carl C. Koch, "Nanostructured Materials: Processing, Properties and Potential Applications", William Andrew Publishing Norwich, 2006.

Elective Paper- VIII-B-1: Practical: Fundamentals of Nanoscience

2hrs/Week

Minimum of 6 experiments to be done and recorded

1. Determination of the Band Gap of Semiconductor Nanoparticles.
2. Surface Enhanced Raman Scattering Activity of Silver Nanoparticles
3. Conversion of Gold Nanorods into Gold Nanoparticles
4. Bimetallic Nanoparticles
5. Processing and Development of Nanoparticle gas sensor
6. Magnetic separation/identification studies of nanoparticles
7. Harvesting light using nano-solar cells
8. Nano-Forensic analysis to identify, individualize and evaluate evidence using nanophase materials
9. Comparison of the performance of nanoparticles based conductive adhesives and conventional non conductive adhesives.
10. Electrodeposition and corrosion behavior of nanostructured composite film
11. Photocatalytic activity of nanomaterials

Semester –VI

Cluster Elective Paper –VIII-B-2: Synthesis and Characterization of Nanomaterials

No. of Hours per week: 04

Total Lectures:60

Unit-I (12 hrs)

1. Nanomaterials synthesis: Synthesis and nanofabrication, Bottom-Up and Top-Down approach with examples. Chemical precipitation methods, sol-gel method, chemical reduction, hydrothermal, process. Physical Methods- ball milling, Physical Vapour deposition (PVD), Sputtering, Chemical Vapor deposition (CVD), spray pyrolysis, Biological methods- Synthesis using micro organisms and bacteria, Synthesis using plant extract, use of proteins and DNA templates.

Unit-II (12 hrs)

2. Classification of materials: Types of materials, Metals, Ceramics (Sand glasses) polymers, composites, semiconductors. Metals and alloys- Phase diagrams of single component, binary and ternary systems, diffusion, nucleation and growth. Diffusional and diffusionless transformations. Mechanical properties. Metallic glasses. Preparation, structure and properties like electrical, magnetic, thermal and mechanical, applications.

UNITS-III (12 hrs)

3. Glasses: The glass transition - theories for the glass transition, Factors that determine the glass-transition temperature. Glass forming systems and ease of glass formation, preparation of glass materials. Applications of Glasses: Introduction: Electronic applications, Electrochemical applications, optical applications, Magnetic applications.

UNITS-IV (12 hrs)

4. Liquid Crystals: Mesomorphism of anisotropic systems, Different liquid crystalline phase and phase transitions, Thermal and electrical properties of liquid crystals, Types Liquid Crystals displays, few applications of liquid crystals.

UNITS-V (12 hrs)

5. Characterization Methods: XRD, SEM, TEM, AFM, XPS and PL characterization techniques for nano materials. Electrical and mechanical properties, Optical properties by IR and Raman Spectroscopy.

References books

1. Encyclopedia of Nanotechnology by M. Balakrishna Rao and K. Krishna Reddy, Vol. I to X, Campus books.
2. Nano: The Essentials-Understanding Nanoscience & Nanotechnology by T. Pradeep; Tata Mc. Graw Hill
3. Nanotechnology in Microelectronics & Optoelectronics, J.M Martine Duart, R.J Martin Palma, F. Agullo Rueda, Elsevier
4. Nanoelectronic Circuit Design, N.K Jha, D Chen, Springer
5. Handbook of Nanophysics- Nanoelectronics & Nanophotonics, K.D Sattler, CRC Press
6. Organic Electronics-Sensors & Biotechnology- R. Shinar & J. Shinar, McGraw-Hill

Cluster Elective Paper- VIII-B-2: Practical: Synthesis and Characterization of Nanomaterials 2hrs/Week

Minimum of 6 experiments to be done and recorded

1. Synthesis of nanocrystalline films of II-VI compounds doped with rare earths by chemical process.
2. Synthesis of Alkaline earth aluminates in nanocrystalline form by combustion synthesis.
3. Preparation of surface conducting glass plate by spray pyrolysis method
4. Preparation of surface conducting glass plate by chemical route
5. Fabrication of micro fluidic nanofilter by polymerisation reaction
6. Absorption studies on the nanocrystalline films and determination of absorption coefficient.
7. Determination of band gap from the absorption spectra using Tauc's plots.
8. Study of Hall effect in semiconductors and its application in nanotechnology.
9. Measurement of electrical conductivity of semiconductor film by Four Probe method and study of temperature variation of electrical conductivity.

Semester –VI

Cluster Elective Paper –VIII-B-3: Applications of Nanomaterials and Devices

No. of Hours per week: 04

Total Lectures:60

UNIT-I (12 hrs)

1. Optical properties: Coulomb interaction in nanostructures. Concept of dielectric constant for nanostructures and charging of nanostructure. Quasi-particles and excitons. Excitons in direct and indirect band gap semiconductor nanocrystals. Quantitative treatment of quasi-particles and excitons, charging effects. Radiative processes: General formalization-absorption, emission and luminescence. Optical properties of heterostructures and nanostructures.

UNIT-II (12 hrs)

2. Electrical transport:

Carrier transport in nanostructures. Hall effect, determination of carrier mobility and carrier concentration; Coulomb blockade effect, thermionic emission, tunneling and hopping conductivity. Defects and impurities: Deep level and surface defects.

UNIT-III (12 hrs)

3. Applications: Applications of nanoparticles, quantum dots, nanowires and thin films for photonic devices (LED, solar cells). Single electron transfer devices (no derivation). CNT based transistors. Nanomaterial Devices: Quantum dots heterostructures lasers, optical switching and optical data storage. Magnetic quantum well; magnetic dots - magnetic data storage. Micro Electromechanical Systems (MEMS), Nano Electromechanical Systems (NEMS).

UNIT-IV (12 hrs)

4. Nanoelectronics: Introduction, Electronic structure of Nanocrystals, Tuning the Band gap of Nanoscale semiconductors, Excitons, Quantum dot, Single electron devices, Nanostructured ferromagnetism, Effect of bulk nanostructuring of magnetic properties, Dynamics of nanomagnets, Nanocarbon ferromagnets, Giant and colossal magneto-resistance, Introduction of spintronics, Spintronics devices and applications.

UNIT-V (12 hrs)

5. Nanobiotechnology and Medical application: Introduction, Biological building blocks- size of building blocks and nanostructures, Peptide nanowires and protein nanoparticles, DNA double nanowires, Nanomaterials in drug delivery and therapy, Nanomedicine, Targeted gold nanoparticles for imaging and therapy.

Reference books:

1. C.P. Poole, Jr. Frank J. Owens, Introduction to Nanotechnology (Wiley India Pvt. Ltd.).
2. S.K. Kulkarni, Nanotechnology: Principles & Practices (Capital Publishing Company).
3. K.K. Chattopadhyay and A.N. Banerjee, Introduction to Nanoscience & Technology (PHI Learning Private Limited).
4. Richard Booker, Earl Boysen, Nanotechnology (John Wiley and Sons).

Cluster Elective Paper-VIII-B-3: Practical: Applications of Nanomaterials and Devices

2hrs/Week

Minimum of 6 experiments to be done and recorded

1. Synthesis of metal nanoparticles by chemical route.
2. Synthesis of semiconductor nanoparticles.
3. Surface Plasmon study of metal nanoparticles by UV-Visible spectrophotometer.
4. XRD pattern of nanomaterials and estimation of particle size.
5. To study the effect of size on color of nanomaterials.
6. Prepare a disc of ceramic of a compound using ball milling, pressing and sintering, and study its XRD.
7. Fabricate a thin film of nanoparticles by spin coating (or chemical route) and study transmittance spectra in UV-Visible region.
8. Fabricate a pn-diode by diffusing Al over the surface of n-type Si and study its I-V characteristics.

Semester –VI
Cluster Electives –VIII-C

Elective Paper –VIII-C-1: Solar Thermal and Photovoltaic Aspects

No. of Hours per week: 04

Total Lectures:60

UNIT-I (12 hrs)

1. Basics of Solar Radiation: Structure of Sun, Spectral distribution of extra terrestrial radiation, Solar constant, Concept of Zenith angle and air mass, Definition of declination, hour angle, solar and surface azimuth angles; Direct, diffuse and total solar radiation, Solar intensity measurement – Thermoelectric pyranometer and pyrheliometer.

2. Radiative Properties and Characteristics of Materials: Reflection, absorption and transmission of solar radiation through single and multi covers; Kirchoff's law – Relation between absorptance, emittance and reflectance; Selective Surfaces - preparation and characterization, Types and applications; Anti-reflective coating.

UNIT-II (14 hrs)

3. Flat Plate Collectors (FPC) : Description of flat plate collector, Liquid heating type FPC, Energy balance equation, Efficiency, Temperature distribution in FPC, Definitions of fin efficiency and collector efficiency, Evacuated tubular collectors.

4. Concentrating Collectors: Classification, design and performance parameters; Definitions of aperture, rim-angle, concentration ratio and acceptance angle; Tracking systems; Parabolic trough concentrators; Concentrators with point focus.

Unit-III (14 hrs)

5. Solar photovoltaic (PV) cell: Physics of solar cell –Type of interfaces, homo, hetero and schottky interfaces, Photovoltaic Effect, Equivalent circuit of solar cell, Solar cell output parameters, Series and shunt resistances and its effect on cell efficiency; Variation of efficiency with band-gap and temperature.

6. Solar cell fabrication: Production of single crystal Silicon: Czochralski (CZ) and Float Zone (FZ) methods, Silicon wafer fabrication, Wafer to cell formation, Thin film solar cells, Advantages, CdTe/CdS cell formation, Multi-junction solar cell; Basic concept of Dye-sensitized solar cell, Quantum dot solar cell.

UNIT-IV (8 hrs)

Solar PV systems: Solar cell module assembly – Steps involved in the fabrication of solar module, Module performance, I-V characteristics, Modules in series and parallel, Module protection – use of Bypass and Blocking diodes, Solar PV system and its components, PV array, inverter, battery and load.

UNIT-V (12 hrs)

Solar thermal applications: Solar hot water system (SHWS), Types of SHWS, Standard method of testing the efficiency of SHWS; Passive space heating and cooling concepts, Solar desalinator and drier, Solar thermal power generation.

Solar PV applications: SPV systems; Stand alone, hybrid and grid connected systems, System installation, operation and maintenances; Field experience; PV market analysis and economics of SPV systems.

Reference Books:

1. Solar Energy Utilization, G. D. Rai, Khanna Publishers
2. Solar Energy- Fundamentals, design, modeling and applications, G.N. Tiwari, Narosa Pub., 2005.
3. Solar Energy-Principles of thermal energy collection & storage, S.P. Sukhatme, Tata Mc-Graw Hill Publishers, 1999.
4. Solar Photovoltaics- Fundamentals, technologies and applications, Chetan Singh Solanki, PHI Learning Pvt. Ltd.,
5. Science and Technology of Photovoltaics, P. Jayarama Reddy, BS Publications, 2004.

Cluster Elective Paper- VIII-C-1: Practical: Solar Thermal and Photovoltaic Aspects

2hrs/Week

Minimum of 6 experiments to be done and recorded

1. Measurement of direct solar radiation using pyrheliometer.
2. Measurement of global and diffuse solar radiation using pyranometer.
3. Measurement of emissivity, reflectivity and transmissivity.
4. Measurement of efficiency of solar flat plate collector.
5. Performance testing of solar air dryer unit.
6. Effect of tilt angle on the efficiency of solar photovoltaic panel.
7. Study on solar photovoltaic panel in series and parallel combination.

Semester - VI

Cluster Elective Paper –VIII-C-2 :Wind, Hydro and Ocean Energies

No. of Hours per week: 04

Total Lectures:60

UNIT-I

1. **Introduction:** Wind generation, meteorology of wind, world distribution of wind, wind speed variation with height, wind speed statistics, Wind energy conversion principles; General introduction; Types and classification of WECS; Power, torque and speed characteristics.

2. Wind Measurements: Eolian features, biological indicators, rotational anemometers, other anemometers, wind measurements with balloons.

UNIT-II

3. Wind Energy Conversion System: Aerodynamic design principles; Aerodynamic theories; Axial momentum, blade element and combine theory; Rotor characteristics; Maximum power coefficient; Prandtl's tip loss correction.

4. Design of Wind Turbine: Wind turbine design considerations; Methodology; Theoretical simulation of wind turbine characteristics; Test methods.

UNIT-III

5. Wind Energy Application: Wind pumps: Performance analysis, design concept and testing; Principle of wind energy generation; Standalone, grid connected and hybrid applications of wind energy conversion systems, Economics of wind energy utilization; Wind energy in India; Environmental Impacts of Wind farms.

UNIT-IV

6. Small Hydropower Systems: Overview of micro, mini and small hydro systems; Hydrology; Elements of pumps and turbine; Selection and design criteria of pumps and turbines; Site selection; Speed and voltage regulation; Investment issues load management and tariff collection; potential of small hydro power in India. Wind and hydro based stand-alone hybrid power systems.

UNIT-V

7. Ocean Thermal, Tidal and Wave Energy Systems: Ocean Thermal - Introduction, Technology process, Working principle, Resource and site requirements, Location of OCET system, Electricity generation methods from OCET, Advantages and disadvantages, Applications of OTEC,

8. Tidal Energy - Introduction, Origin and nature of tidal energy, Merits and limitations, Tidal energy technology, Tidal range power, Basic modes of operation of tidal systems. Wave Energy – Introduction, Basics of wave motion, Power in waves, Wave energy conversion devices, Advantages and disadvantages, Applications of wave energy.

Reference Books:

1. Dan Charis, Mick Sagrillo, Lan Woofenden, "Power from the Wind", New Society Pub., 2009.
2. Erich Hau, "Wind Turbines-Fundamentals, Technologies, Applications, Economics", 2nd Edition, Springer Verlag, Berlin Heidelberg, NY, 2006.
3. Joshue Earnest, Tore Wizelius, "Wind Power and Project Development", PHI Pub., 2011.
4. T. Burton, D. Sharpe, N. Jenkins, E. Bossanyi, "Wind Energy Handbook", John Wiley Pub., 2001.
5. Paul Gipe, "Wind Energy Basics", Chelsea Green Publications, 1999.
6. Khan, B.H., "Non-Conventional Energy Resources", TMH, 2nd Edition, New Delhi, 2009.
7. Tiwari, G.N., and Ghosal, M.K, "Renewable Energy Resources – Basic Principles and applications", Narosa Publishing House, 2007.

Cluster Elective Paper- VIII-C-2 Practical: Wind, Hydro and Ocean Energies

2hrs/Week

Minimum of 6 experiments to be done and recorded

1. Estimation of wind speed using anemometer.
2. Determination of characteristics of a wind generator
3. Study the effect of number and size of blades of a wind turbine on electric power output.
4. Performance evaluation of vertical and horizontal axes wind turbine rotors.
5. Study the effect of density of water on the output power of hydroelectric generator.
6. Study the effect of wave amplitude and frequency on the wave energy generated.

Semester - VI
Cluster Elective Paper –VIII-C-3 :Energy Storage Devices

No. of Hours per week: 04

Total Lectures:60

UNIT-I (12 hr)

1. Energy Storage : Need of energy storage; Different modes of energy storage, Flywheel storage, Electrical and magnetic energy storage: Capacitors, electromagnets; Chemical Energy storage: Thermo-chemical, photo-chemical, bio-chemical, electro-chemical, fossil fuels and synthetic fuels. Hydrogen for energy storage.

UNIT-II (12 hrs)

2. Electrochemical Energy Storage Systems : Batteries: Primary, Secondary, Lithium, Solid-state and molten solvent batteries; Leadacid batteries; Nickel Cadmium Batteries; Advanced Batteries. Role of carbon nano-tubes in electrodes.

UNIT-III (12 hrs)

3. Magnetic and Electric Energy Storage Systems: Superconducting Magnet Energy Storage(SMES) systems; Capacitor and battery: Comparison and application; Super capacitor: Electrochemical Double Layer Capacitor(EDLC), principle of working, structure, performance and application.

UNIT-IV (12 hrs)

4. Fuel Cell: Fuel cell definition, difference between batteries and fuel cells, fuel cell components, principle and working of fuel cell, performance characteristics, efficiency, fuel cell stack, fuel cell power plant: fuel processor, fuel cell power section, power conditioner, Advantages and disadvantages.

UNIT-V (12 hrs)

5. Types of Fuel Cells: Alkaline fuel cell, polymer electrolyte fuel cell, phosphoric acid fuel cell, molten carbonate fuel cell; solid oxide fuel cell, proton exchange membrane fuel cell, problems with fuel cells, applications of fuel cells.

REFERENCE BOOKS

1. J. Jensen and B. Squirensen, Fundamentals of Energy Storage, John Wiley, NY, 1984.
2. M. Barak, Electrochemical Power Sources: Primary and Secondary Batteries by, P. Peregrinus, IEE, 1980.
3. P.D. Dunn, Renewable Energies, Peter Peregrinus Ltd, London, 1986.
4. B. Viswanathan and M. A. Scibioh, Fuel Cells-Principles and Applications, University Press, 2006.
5. Hart, A.B and G.J. Womack, Fuel Cells: Theory and Application, Prentice Hall, New York, 1989.

Cluster Elective Paper –VIII-C-3: Practical: Energy Storage Devices

2hrs/Week

Minimum of 6 experiments to be done and recorded

1. Study of charge and discharge characteristics of storage battery.
2. Study of charging and discharging behavior of a capacitor.
3. Determination of efficiency of DC-AC inverter and DC-DC converters
4. Study of charging characteristics of a Ni-Cd battery using solar photovoltaic panel.
5. Performance estimation of a fuel cell.
6. Study of effect of temperature on the performance of fuel cell.

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR VI SEMESTER

**Paper-VII: Elective-I(A)
Operating Systems**

Course Objectives

1. To understand the services provided by and the design of an operating system.
2. To understand the structure and organization of the file system.
3. To understand what a process is and how processes are synchronized and scheduled.
4. To understand different approaches to memory management.
5. Students should be able to use system calls for managing processes, memory and the file system.

Course Outcomes

1. Analyze the concepts of processes in operating system and illustration of the scheduling of processor for a given problem instance.
2. Identify the dead lock situation and provide appropriate solution so that protection and security of the operating system is also maintained.
3. Analyze memory management techniques, concepts of virtual memory and disk scheduling.
4. Understand the implementation of file systems and directories along with the interfacing of IO devices with the operating system.

UNIT - I

Operating System Introduction: Operating Systems Objectives and functions, Computer System Architecture, OS Structure, Evolution of Operating Systems (Simple Batch, Multi programmed, Distributed Systems, Real-Time Systems), Operating System services.

UNIT - II

Process and CPU Scheduling - Process concepts - The Process, Process State, Process Control Block, Threads, Process Scheduling - Schedulers, Preemptive and non-preemptive Scheduling algorithms (FCFS, SJF, RR)

UNIT - III

Memory Management and Virtual Memory - Logical & physical Address Space, Swapping, Contiguous Allocation, Paging, Structure of Page Table. Segmentation, Segmentation with paging

Andhra Pradesh State Council of Higher Education
B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS
w.e.f.2017-2018

Structure of Computer Science/Information Technology (IT) Syllabus

UNIT - IV

File System Interface - The Concept of a File, Access methods, Directory Structure, File Sharing, Protection, File System Structure

Mass Storage Structure - Overview of Mass Storage Structure, Disk Structure, Disk Attachment

UNIT - V

Deadlocks - System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery from Deadlock.

TEXT BOOK

1. Operating System Principles, Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8th Edition, Wiley Student Edition.
2. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson.

REFERENCES BOOKS:

1. Principles of Operating Systems by Naresh Chauhan, OXFORD University Press
2. Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.
3. Operating Systems A concept - based Approach, 2nd Edition, D. M. Dhamdhare, TMH.
4. Principles of Operating Systems, B. L. Stuart, Cengage learning, India Edition.
5. Operating Systems, A. S. Godbole, 2nd Edition, TMH

Student Activity:

1. Load any new operating system into your computer.
2. Partition the memory in your system
3. Create a file in a directory structure

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE
CBCS – BSc(Computer Science) - III YEAR - SEMESTER-V
Paper-VII : Elective-I(A)
OPERATING SYSTEMS
MODEL QUESTION PAPER

Time: 3 Hours

Max. Marks : 75

SECTION-A

Answer any **FIVE** of the following Questions:

(5 x 5= 25 Marks)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

SECTION - B

Answer any **FIVE** of the following Questions

(5 × 10 =50 Marks)

- 11.
- 12.
- 13.
- 14.
- 15.
- 16.
- 17.
- 18.
- 19.
- 20.

Instruction to Paper Setter:

Two questions must be given from each unit in Section-A and Section-B

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR VI SEMESTER

Paper-VII: Elective-I(A)

Operating Systems Lab

1. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time.
2. Developing applications using Inter Process Communication (using shared memory)
3. Implement any two memory management schemes
4. Implement file allocation techniques (Linked)
5. Implement Deadlock prevention algorithm.
6. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Round robin. Compute and print the average waiting time and average turnaround time.
7. Implement file allocation techniques (Indexed)
8. Implement file allocation techniques (Contiguous)
9. Developing applications using Inter Process Communication (pipes)
10. Developing applications using Inter Process Communication (message queues)
11. Implement Deadlock detection algorithm.
12. Implement Deadlock avoidance algorithm.

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR VI SEMESTER
Paper-VII: Elective-I(B)
DISTRIBUTED SYSTEMS

Course Objectives

- To expose the fundamentals of distributed computer systems, assuming the availability of facilities for data transmission.
- To discuss multiple levels of distributed algorithms, distributed file systems, distributed databases, security and protection.

Course Outcomes

- Create models for distributed systems.
- Apply different techniques learned in the distributed system.

UNIT I

Introduction to Distributed Computing Systems, System Models, and Issues in Designing a Distributed Operating System, Examples of distributed systems.

UNIT II

Features of Message Passing System, Synchronization and Buffering, Introduction to RPC and its models, Transparency of RPC, Implementation Mechanism, Stub Generation and RPC Messages, Server Management, Call Semantics, Communication Protocols and Client Server Binding.

UNIT III

Introduction, Design and implementation of DSM system, Granularity and Consistency Model, Advantages of DSM, Clock Synchronization, Event Ordering, Mutual exclusion, Deadlock, Election Algorithms.

UNIT IV

Task Assignment Approach, Load Balancing Approach, Load Sharing Approach, Process Migration and Threads.

UNIT V

File Models, File Accessing Models, File Sharing Semantics, File Caching Schemes, File Replication, Atomic Transactions, Cryptography, Authentication, Access control and Digital Signatures.

Text Book

1.Pradeep. K. Sinha: “ Distributed Operating Systems: Concepts and Design ” , PHI, 2007.

Reference Books

1 .George Coulouris, Jean Dollimore, Tim Kindberg: “ Distributed Systems” , Concept and Design, 3rd Edition, Pearson Education, 2005.

Student Activity

1. Implementation of Distributed Mutual Exclusion Algorithm.
2. Create a Distributed Simulation Environment.

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE

CBCS – BSc(Computer Science) - III YEAR - SEMESTER-V

Paper-VII : Elective-I(B)

DISTRIBUTED SYSTEMS

MODEL QUESTION PAPER

Time: 3 Hours

Max. Marks : 75

SECTION-A

Answer any **FIVE** of the following Questions:

(5 x 5= 25 Marks)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

SECTION - B

Answer any **FIVE** of the following Questions

(5 × 10 =50 Marks)

- 11.
- 12.
- 13.
- 14.
- 15.
- 16.
- 17.
- 18.
- 19.
- 20.

Instruction to Paper Setter:

Two questions must be given from each unit in Section-A and Section-B

Andhra Pradesh State Council of Higher Education

B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS
w.e.f.2017-2018

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR VI SEMESTER
Paper-VII: Elective-I(B)

DISTRIBUTED SYSTEMS LAB

1. Java program using RPC
2. Java program using Client/Server implementation
3. Java program to implement deadlock avoidance
4. Implementation of mutual exclusion
5. Java program to demonstrate clock synchronization
6. Java program to implementation of election algorithm
7. Java program to implement threads
8. File replication methods
9. Java program for access a sequential file
10. Implementation cryptography techniques

Andhra Pradesh State Council of Higher Education
B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS
w.e.f.2017-2018

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR VI SEMESTER

Paper-VII : Elective-I(C)

Web Technologies

Course Objective

- To provide knowledge on web architecture, web services, client side and server side scripting technologies to focus on the development of web-based information systems and web services.
 - To provide skills to design interactive and dynamic web sites.

Course Outcome

1. To understand the web architecture and web services.
2. To practice latest web technologies and tools by conducting experiments.
3. To design interactive web pages using HTML and Style sheets.
4. To study the framework and building blocks of .NET Integrated Development Environment.
5. To provide solutions by identifying and formulating IT related problems.

UNIT -1

Introduction to Internet : Definition of Internet – History of Internet – Advantages & disadvantages of Internet – Tools of internet - How internet works. Introduction to WWW: Definition of WWW –WWW tools - Web Terminology –web browser – web server

UNIT-2

E-Mail : Definition of e-mail – advantages & disadvantages of e-mail – how to work with e-mail accounts – e-mail inner working : Store and forward method & Central mail spool method– message components – message composition – features of e-mail. Protocols: TCP/IP - HTTP

UNIT -3

Introduction to HTML: Basic HTML – HTML document structure – HTML tags – Basefont tag – title tag – body tag – Text formatting tags – Character tags - Character entities
HTML Lists : Ordered List , Unordered List & Definition List – Using colors – Using Images

Andhra Pradesh State Council of Higher Education
B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS
w.e.f.2017-2018

Structure of Computer Science/Information Technology (IT) Syllabus

UNIT – 4

Horizontal Rule Tag - HTML Tables – Nested Tables - Hyperlinks: Textual, Graphical Links to sections – Multimedia Objects – Frames – Nested Frames – Forms – Form Controls : textbox, password, checkbox, radio button, select, text area - Processing of forms

UNIT – 5

Advanced HTML : Cascading Style Sheets: Introduction – Using Styles: As an attribute, tag & external file – Defining Your own styles – Properties and values : properties related to Fonts , Backgrounds & colors, text , boxes & borders

Text Book

1. Inline/Online: Fundamentals of the Internet and the World Wide Web, Raymond Greenlaw Ellen Hepp, McGraw – Hill
2. Harvey M. Deitel and Paul J. Deitel, “**Internet & World Wide Web How to Program**”, 4/e, Pearson Education.

References:

1. Chris Bates, **Web Programming Building Internet Applications**, Second Edition, Wiley.
2. Uttam Kumar Roy, **Web Technologies** from Oxford University Press
3. Paul S.Wang Sanda S. Katila, **An Introduction to Web Design Plus Programming**, Thomson.
4. Robert W.Sebesta, **Programming the World Wide Web**, Third Edition, Pearson Education.
5. Joel Sklar, **Principles of Web Design**, Thomson.
6. Raj Kamal, **Internet and Web Technologies**, Tata McGraw Hill.
7. Gopalan & Akilandeswari, **Web Technology: A Developer’s Perspective**, PHI.

Student Activities:

1. Prepare a web site for your college
2. Prepare your personal website

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE
CBCS – BSc(Computer Science) - III YEAR - SEMESTER-V
Paper-VII : Elective-I(C)
WEB TECHNOLOGIES
MODEL QUESTION PAPER

Time: 3 Hours

Max. Marks : 75

Section-A

*Answer any **FIVE** of the following Questions:*

(5 x 5= 25 Marks)

1. What is Internet? Write about advantages of Internet
2. Explain briefly about web server
3. What is protocol? Explain TCP/IP
4. Explain about message composition in Internet
5. What is HTML? Explain HTML document structure
6. Write about Basefont tag
7. Briefly explain about hyperlinks
8. Explain about frames
9. What is a property? Explain various properties
10. Explain about attribute.

Section - B

*Answer any **FIVE** of the following Questions*

(5 × 10 =50 Marks)

11. Write about Tools of WWW
12. Explain about how Internet works
13. Write about e-mail advantages.
14. Explain various message components in creating an e-mail
15. Write in detail about HTML tags.
16. Explain about HTML lists.
17. Explain about tables in HTML
18. Write about form controls used in designing a web page.
19. Explain CSS with an example
20. Illustrate how to create a web page with your own styles.

Instruction to Paper Setter:

Two questions must be given from each unit in Section-A and Section-B

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR VI SEMESTER

Paper-VII : Elective-I(C)

Web Technologies Lab

1. Create a simple HTML page which demonstrates all types of lists.
2. Create a letter head of your college using following styles
 - i. image as background
 - ii. use header tags to format college name and address
3. Create a web page, which contains hyper links like fruits, flowers, animals. When you click on hyper links, it must take you to related web page; these web pages must contain with related images.
4. Create a hyperlink to move around within a single page rather than to load another page.
5. Create a leave letter using different text formatting tags.
6. Create a table format given bellow using row span and colspan.

| RNO | NAME | MARKS | | | | |
|-----|------|-------|----|----|----|----|
| | | M1 | M2 | M3 | M4 | M5 |

Insert 5 records.

7. Create a table with different formats as given bellow.
 - i. Give different background and font colors to table header, footer and body.
 - ii. Use table caption tag.
8. Divide a web page vertically and horizontally with scroll bars, name them as shown bellow decorate it with some items.

| | |
|----|----|
| F1 | F2 |
| | F3 |

9. Create a student Bio-Data, using forms.
10. Create a web page using following style sheets
 - i. Inline style sheets.
 - ii. Embedded style sheets.
 - iii. External style sheets

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR VI SEMESTER
(Cluster A) Paper-VIII : Elective-II-1
VISUAL BASIC PROGRAMMING

Course Objective

- To provide knowledge on GUI programming concepts
- To provide skills to understand how controls are used in programming

Course Outcome

1. To understand the Graphical user interface design
2. To understand input and output operations using forms
3. To study the menu design
4. To study the coding system of various controls

UNIT – I

Object Oriented Programming : Introduction to OOPS – Basic Concepts – Objects and Classes – Concepts of Inheritance, Encapsulation and Polymorphism.

Fundamentals Of Visual Basic : Introduction – Features of VB – VB Editions – Controls – Properties – Events – Methods.

UNIT – II

Application Window

Project Explorer – The Properties Window – Tool Box: Text Box Control – Command Button – Check Box – The line and shape controls – Menu Bar – Tool bars – Tool box – Project explorer window – Properties window – Object browser – Form Designer – Code editor window – Form layout window

UNIT-III:

Forms and controls:

Setting form properties – Working with Properties Window – Name – Caption – Picture – The Controls box – Min button and Max button – Movable – Border style – Font – properties

Form methods: Move, Graphic methods, Show method

Form Events - Working with a control – Opening the code window.

UNIT – IV

Variables in VB: Declaring variables – Data types – Constants – Conversion – Arrays

Writing Code in VB: The code window – Subroutine – control Structures in VB – Performing Loops in VB.

UNIT V

Arrays: Definition, one dimensional and two dimensional arrays, declaring array, storing values in an array

Menus: Menu convention – creating menus in VB

Multiple Documents Interfaces: Features of MDI Form – Property – Creating MDI forms

TEXT BOOKS:

1. PROGRAMING WITH VISUAL BASIC – MOHAMMED AZAM – Vikas publishing house Pvt.Ltd. – New Delhi.

2. OBJECT ORIENTED PROGRAMING – E. BALAGURUSWAMY – Tata McGraw – Hill Publishing Company Limited – New Delhi.

REFERENCE BOOKS:

1. 'VISUAL BASIC 6.0 PROGRAMMING ' – Content Development Group – Tata McGraw – Hill Publishing Company Limited – 2002 – New Delhi
2. 'INTRODUCTION TO OOP AND VB' – V.K.JAIN – Vikas Publishing House – New Delhi
3. 'VISUAL BASIC 6' – PAUL SHERIEF –PRENTICE HALL OF INDIA Pvt. Ltd – New Delhi.
4. 'TEACH YOURSELF VISUAL BASIC 6' –SCOTT WARNER - Tata McGraw – Hill Publishing Company Limited – New Delhi.
5. "USING VISUAL BAISC 6" – Brain Siler and Jeff Spotts – Prentice Hall Of India Limited – New Delhi – Eleventh Edition (2002).

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE
CBCS – BSc(Computer Science) - III YEAR - SEMESTER-V
(Cluster A) Paper-VIII : Elective-II-1
VISUAL BASIC PROGRAMMING
MODEL QUESTION PAPER

Time: 3 Hours

Max. Marks : 75

Section-A

*Answer any **FIVE** of the following Questions:*

(5 x 5= 25 Marks)

1. Write about classes and objects.
2. Briefly explain Visual Basic editions.
3. Define project explorer window
4. Explain Form Designer
5. Write about forms and controls.
6. What is a method? Explain any three form methods
7. What is a variable? Explain how to declare variables in VB
8. Explain constants in Visual Basic
9. Define an array. Write about declaring an array
10. What is menu? Explain

Section - B

*Answer any **FIVE** of the following Questions*

(5 × 10 =50 Marks)

11. Write about basic concepts of OOPS
12. Write in detail about features of VB
13. What is tool box? Explain various tools in tool box
14. Write about text box control in VB
15. Explain how you will work with properties window.
16. Write about various form events used in Visual Basic.
17. Explain various data types used in Visual Basic
18. Write about looping statements in VB
19. Briefly explain menu creation in Visual Basic
20. Explain in detail about creating a MDI form.

Instruction to Paper Setter:

Two questions must be given from each unit in Section-A and Section-B

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR VI SEMESTER
(Cluster A) Paper-VIII : Elective-II-1

VISUAL BASIC PROGRAMMING LAB

1. Design a form to demonstrate text boxes
2. Design a form to demonstrate check boxes
3. Design a form to demonstrate command buttons
4. Design a form and write code to demonstrate graphic methods of a form
5. Write Visual Basic code to find largest of four numbers
6. Write Visual Basic code to print mathematical table of a number
7. Write Visual Basic code to illustrate select..case statement
8. Write Visual Basic code to find whether a number is prime or not
9. Design a form for simple calculator
10. Design a form to demonstrate various events of a form
11. Menu creation
12. MDI form creation

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR VI SEMESTER
(Cluster A) Paper-VIII : Elective-II-2

PHP (PERSONAL HOME PAGE)

Course Objective

- To provide knowledge on web architecture, web services, client side and server side scripting technologies to focus on the development of web-based information systems and web services.
 - To provide skills to design interactive and dynamic web sites.

Course Outcome

1. To understand the web architecture and web services.
2. To practice latest web technologies and tools by conducting experiments.
3. To design interactive web pages using PHP

UNIT - I

The Building Blocks of PHP

What is PHP? - Variables - Data Types - Operators and Expressions - Constants

Flow Control Functions in PHP

Switching Flow - Loops - Code Blocks and Browser Output

UNIT - II

Working with Functions

What Is a Function - Calling Functions - Defining a Function - Returning Values from User-Defined Functions - Variable Scope - Saving State Between Function Calls with the static Statement - Arguments - Testing for the Existence of a Function

UNIT - III

Working with Arrays

What Are Arrays - Creating Arrays – Array Related Constructs and Functions

Working with Objects

Creating an Object - Object Inheritance

UNIT - IV

Working with Strings, Dates, and Time

Formatting Strings - Investigating Strings - Manipulating Strings

Using Date and Time Functions - Date, and Time Functions - Other String,

Andhra Pradesh State Council of Higher Education
B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS
w.e.f.2017-2018

Structure of Computer Science/Information Technology (IT) Syllabus

UNIT - V

Working with Forms

Creating a Simple Input Form - Accessing Form Input with User-Defined Arrays -
Combining HTML and PHP Code on a Single Page - Using Hidden Fields to Save State -
Redirecting the User - Sending Mail on Form Submission - Working with File Uploads

Text books:

1. Sams Teach Yourself PHP, MySQL, and Apache All in One, Fifth Edition - Meloni, Julie C. 2012 by Pearson Education

Reference Book

1. Visual QuickStart Guide - PHP for the Web, Fourth Edition - Larry Ullman
2. PHP Bible, Tim Converse Joyce Park, 2nd Edition, Wiley
3. Beginning PHP4, Wankyu Choi, Allan Kent, Chris Lea, Ganesh Prasad, Chris Ullman
Wrox publications

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE
CBCS – BSc(Computer Science) - III YEAR - SEMESTER-V
(Cluster A) Paper-VIII : Elective-II-2
PHP (PERSONAL HOME PAGE)
MODEL QUESTION PAPER

Time: 3 Hours

Max. Marks : 75

Section-A

Answer any FIVE of the following Questions:

(5 x 5= 25 Marks)

1. Write about variables used in PHP
2. Illustrate constants in PHP
3. Explain defining a function.
4. Write about returning values from a function
5. What are arrays? Explain
6. Explain how to create an object in PHP
7. Define String. Write about formatting strings
8. Write any five date functions with examples
9. What is a form? Explain form input
10. Explain how to send a mail on form submission.

Section - B

Answer any FIVE of the following Questions

(5 × 10 =50 Marks)

11. Explain various data types used in PHP
12. Write about various loop statements.
13. What is a function? Explain with an example
14. Write about scope of variables
15. Explain how you will create arrays in PHP
16. Write about working with object in PHP
17. Explain how to manipulate strings with an example
18. Write about time functions with an example
19. Briefly explain how to combine HTML and PHP code on a single page
20. Explain various form elements in PHP

Instruction to Paper Setter:

Two questions must be given from each unit in Section-A and Section-B

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR VI SEMESTER
(Cluster A) Paper-VIII : Elective-II-2

PHP (PERSONAL HOME PAGE) LAB

1. PHP program to demonstrate arithmetic operators
2. PHP program to demonstrate various constants
3. PHP program to find biggest of 5 numbers
4. PHP program to print sum of natural numbers
5. PHP program to find factorial of a number using function
6. PHP program to sort a list of values using an array
7. PHP program to implement any two array related constructs
8. PHP program to create an object
9. PHP program to implement single inheritance
10. PHP program to manipulate strings
11. PHP program to implement date functions
12. PHP program to create a simple form

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR VI SEMESTER
(Cluster B) Paper-VIII : Elective-II-1

FOUNDATIONS OF DATA SCIENCE

Course Objectives

Modern scientific, engineering, and business applications are increasingly dependent on data, existing traditional data analysis technologies were not designed for the complexity of the modern world. Data Science has emerged as a new, exciting, and fast-paced discipline that explores novel statistical, algorithmic, and implementation challenges that emerge in processing, storing, and extracting knowledge from Big Data.

Course Outcomes

4. Able to apply fundamental algorithmic ideas to process data.
5. Learn to apply hypotheses and data into actionable predictions.
6. Document and transfer the results and effectively communicate the findings using visualization techniques.

UNIT I

INTRODUCTION TO DATA SCIENCE :Data science process – roles, stages in data science project – working with data from files – working with relational databases – exploring data – managing data – cleaning and sampling for modeling and validation – introduction to NoSQL.

UNIT II

MODELING METHODS :Choosing and evaluating models – mapping problems to machine learning, evaluating clustering models, validating models – cluster analysis – K-means algorithm, Naïve Bayes – Memorization Methods – Linear and logistic regression – unsupervised methods.

UNIT III

INTRODUCTION TO R Language: Reading and getting data into R – ordered and unordered factors – arrays and matrices – lists and data frames – reading data from files – probability distributions – statistical models in R - manipulating objects – data distribution.

Structure of Computer Science/Information Technology (IT) Syllabus

UNIT IV

MAP REDUCE: Introduction – distributed file system – algorithms using map reduce, Matrix-Vector Multiplication by Map Reduce – Hadoop - Understanding the Map Reduce architecture - Writing Hadoop Map Reduce Programs - Loading data into HDFS - Executing the Map phase - Shuffling and sorting - Reducing phase execution.

UNIT V

DELIVERING RESULTS :Documentation and deployment – producing effective presentations– Introduction to graphical analysis – plot() function – displaying multivariate data – matrix plots – multiple plots in one window - exporting graph - using graphics parameters.

Reference Books

- 1.Nina Zumel, John Mount, “Practical Data Science with R”, Manning Publications, 2014.
- 2.Jure Leskovec, Anand Rajaraman, Jeffrey D.Ullman, “Mining of Massive Datasets”, Cambridge University Press, 2014.
- 3.Mark Gardener, “Beginning R - The Statistical Programming Language”, John Wiley & Sons, Inc., 2012.
- 4.W. N. Venables, D. M. Smith and the R Core Team, “An Introduction to R”, 2013.
- 5.Tony Ojeda, Sean Patrick Murphy, Benjamin Bengfort, Abhijit Dasgupta, “Practical Data Science Cookbook”, Packt Publishing Ltd., 2014.
- 6.Nathan Yau, “Visualize This: The FlowingData Guide to Design, Visualization, and Statistics”, Wiley, 2011.
- 7.Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, “Professional Hadoop Solutions”, Wiley, ISBN: 9788126551071, 2015.

Student Activity:

1. **Collect data from any real time system and create clusters using any clustering algorithm**
2. **Read the student exam data in R perform statistical analysis on data and print results.**

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CBCS – BSc(Computer Science) - III YEAR - SEMESTER-V
(Cluster B) Paper-VIII : Elective-II-1

FOUNDATIONS OF DATA SCIENCE

MODEL QUESTION PAPER

Time: 3 Hours

Max. Marks : 75

SECTION-A

*Answer any **FIVE** of the following Questions:*

(5 x 5= 25 Marks)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

SECTION - B

*Answer any **FIVE** of the following Questions*

(5 × 10 =50 Marks)

- 11.
- 12.
- 13.
- 14.
- 15.
- 16.
- 17.
- 18.
- 19.
- 20.

Instruction to Paper Setter:

Two questions must be given from each unit in Section-A and Section-B

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR VI SEMESTER
(Cluster B) Paper-VIII : Elective-II-1

FOUNDATIONS OF DATA SCIENCE LAB

- 1) Installing R and R studio
 - 2) Basic Operations in R
 - a. Arithmetic Operations
 - b. Logical Operators - <=, >, >=, =, !=, &&
 - 3) Basic data manipulation using R
 - 4) Operation on vectors and matrices.
 - 5) Basic Plotting
 - 6) Frequency plots
 - 7) Box plots
 - 8) Bar charts & Pie charts
 - 9) While, for break, next, repeat.
 - 10) Basic functions- Print(), exp(), Log(), sqrt(), abs(), sin(), Cos(), tan(), factorial(), rand().
-

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR VI SEMESTER
(Cluster B) Paper-VIII : Elective-II-2

BIG DATA TECHNOLOGY

Course Objective

The Objective of this course is to provide practical foundation level training that enables immediate and effective participation in big data projects. The course provides grounding in basic and advanced methods to big data technology and tools, including MapReduce and Hadoop and its ecosystem.

Course Outcome

1. Learn tips and tricks for Big Data use cases and solutions.
2. Learn to build and maintain reliable, scalable, distributed systems with Apache Hadoop.
3. Able to apply Hadoop ecosystem components.

UNIT I

INTRODUCTION TO BIG DATA: Introduction – distributed file system – Big Data and its importance, Four V's in bigdata, Drivers for Big data, Big data analytics, Big data applications. Algorithms using map reduce, Matrix-Vector Multiplication by Map Reduce.

UNIT II

INTRODUCTION HADOOP : Big Data – Apache Hadoop & Hadoop EcoSystem – Moving Data in and out of Hadoop – Understanding inputs and outputs of MapReduce - Data Serialization.

UNIT- III

HADOOP ARCHITECTURE: Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands , Anatomy of File Write and Read., NameNode, Secondary NameNode, and DataNode, Hadoop MapReduce paradigm, Map and Reduce tasks, Job, Tasktrackers - Cluster Setup – SSH & Hadoop Configuration – HDFS Administering – Monitoring & Maintenance.

Andhra Pradesh State Council of Higher Education
B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS
w.e.f.2017-2018

Structure of Computer Science/Information Technology (IT) Syllabus

UNIT-IV

HADOOP ECOSYSTEM AND YARN :Hadoop ecosystem components - Schedulers - Fair and Capacity, Hadoop 2.0 New Features- NameNode High Availability, HDFS Federation, MRv2, YARN, Running MRv1 in YARN.

UNIT-V

HIVE AND HIVEQL, HBASE:-Hive Architecture and Installation, Comparison with Traditional Database, HiveQL - Querying Data - Sorting And Aggregating, Map Reduce Scripts, Joins & Subqueries, HBase concepts- Advanced Usage, Schema Design

Reference Books

1. Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, "Professional Hadoop Solutions", Wiley, ISBN: 9788126551071, 2015.
2. Chris Eaton, Dirk deroos et al. , "Understanding Big data ", McGraw Hill, 2012.
3. Tom White, "HADOOP: The definitive Guide" , O Reilly 2012.
4. Vignesh Prajapati, "Big Data Analytics with R and Haoop", Packet Publishing 2013.
5. Tom Plunkett, Brian Macdonald et al, "Oracle Big Data Handbook", Oracle Press, 2014.
6. Jy Liebowitz, "Big Data and Business analytics",CRC press, 2013.

Student Activity:

1. Collect real time data and justify how it has become Big Data
2. Reduce the dimensionality of a big data using your own map reducer

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CBCS – BSc(Computer Science) - III YEAR - SEMESTER-V
(Cluster B) Paper-VIII : Elective-II-2

BIG DATA TECHNOLOGY

MODEL QUESTION PAPER

Time: 3 Hours

Max. Marks : 75

SECTION-A

*Answer any **FIVE** of the following Questions:*

(5 x 5= 25 Marks)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

SECTION - B

*Answer any **FIVE** of the following Questions*

(5 × 10 =50 Marks)

- 11.
- 12.
- 13.
- 14.
- 15.
- 16.
- 17.
- 18.
- 19.
- 20.

Instruction to Paper Setter:

Two questions must be given from each unit in Section-A and Section-B

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR VI SEMESTER
(Cluster B) Paper-VIII : Elective-II-2

BIG DATA TECHNOLOGY LAB

- 1) Implement the following Data Structures in Java
 - a. Linked Lists
 - b. Stacks
 - c. Queues
- 2) Implement the following Data Structures in Java
 - a. Set
 - b. Map
- 3) Perform setting up and Installing Hadoop in its three operating modes:
 - a. Standalone, Pseudo distributed, Fully distributed
- 4) Use the web based tools to monitor your Hadoop setup.
- 5) Implement the following file management tasks in Hadoop.
 - a. Adding files
 - b. Adding directories
 - c. Retrieving files
 - d. Deleting files

Structure of Computer Science/Information Technology (IT) Syllabus

**III YEAR VI SEMESTER
(Cluster C) Paper-VIII : Elective –II-1**

COMPUTER NETWORKS

Course Objectives

1. To provide an introduction to the fundamental concepts on data communication and the design of computer networks.
2. To get familiarized with the basic protocols of computer networks.

Course Outcomes

After this course, the student will be able to

1. Identify the different components in a Communication System and their respective roles.
2. Describe the technical issues related to the local Area Networks
3. Identify the common technologies available in establishing LAN infrastructure.

UNIT I :

INTRODUCTION: Definition, Advantages of Networks, Network topologies, Types of Networks, Network models – Internet model, OSI model.

THE PHYSICAL LAYER: Digital Transmission – Coding, Sampling, Analog Transmission - Modulation of digital and analog signals, Guided media

UNIT II :

DATA LINK LAYER: Error detection and correction, Data link Protocols - Stop and wait, Go-back-n, Selective repeat.

Wired LANS – Traditional Ethernet, Fast Ethernet, Gigabit Ethernet, Wireless LAN's

UNIT III:

NETWORK LAYER: Inter-networks, Addressing, Network layer Protocols – ARP, IPv4, IPv6

UNIT IV:

TRANSPORT LAYER: Process- to- Process delivery, Congestion and Control, Quality of service (QOS) and techniques to improve QOS.

SECURITY: Introduction, Symmetric- key cryptography, Public key cryptography.

Andhra Pradesh State Council of Higher Education
B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS
w.e.f.2017-2018

Structure of Computer Science/Information Technology (IT) Syllabus

UNIT V:

THE APPLICATION LAYER: Domain Name System-domain name space, distribution of name space, DNS in Internet, Electronic mail, SMTP, File Transfer, FTP, HTTP, World Wide Web.

Text Book

1. Andrew S. Tanenbaum, "Computer Networks", Fifth Edition, Pearson Education.

Reference Books:

1. Bhushan Trivedi, Computer Networks , Oxford University Press
2. James F.Kurose, Keith W.Ross, "Computer Networking", Third Edition, Pearson Education
3. Behrouz A Forouzan, "Data Communications and Networking", Fourth Edition, TMH (2007).
4. Kurose & Ross, "**COMPUTER NETWORKS**" – A Top-down approach featuring the Internet", Pearson Education – Alberto Leon – Garciak.

Student Activity:

1. **Study the functioning of network devices available in your organization .**
 2. **Prepare a pictorial chart of LAN connections in your organization**
-

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CBCS – BSc(Computer Science) - III YEAR - SEMESTER-V
(Cluster C) Paper-VIII : Elective-II-1

COMPUTER NETWORKS
MODEL QUESTION PAPER

Time: 3 Hours

Max. Marks : 75

SECTION-A

Answer any **FIVE** of the following Questions:

(5 x 5= 25 Marks)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

SECTION - B

Answer any **FIVE** of the following Questions

(5 × 10 =50 Marks)

- 11.
- 12.
- 13.
- 14.
- 15.
- 16.
- 17.
- 18.
- 19.
- 20.

Instruction to Paper Setter:

Two questions must be given from each unit in Section-A and Section-B

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR VI SEMESTER
(Cluster C) Paper-VIII : Elective –II-1

COMPUTER NETWORKS LAB

1. Connecting computers in LAN
2. Creating and modifying IP addresses to the systems
3. Java program to implement stop and wait protocols
4. Java program to implement goback-N protocol
5. Java program to implement select-repeat ARQ protocols
6. Java program to implement encryption using RSA algorithm
7. Java program to implement decryption using RSA algorithm
8. Java program to implement encryption using Ceasers Cipher
9. Java program to implement decryption using Ceasers Cipher
10. Java program to implement encryption using transposition cipher

Structure of Computer Science/Information Technology (IT) Syllabus

**III YEAR VI SEMESTER
(Cluster C) Paper-VIII : Elective –II-2**

CLOUD COMPUTING

Course Objectives:

The student will learn about the cloud environment, building software systems and components that scale to millions of users in modern internet, cloud concepts capabilities across the various cloud service models including Iaas, Paas, Saas, and developing cloud based software applications on top of cloud platforms.

Course Outcomes

1. Compare the strengths and limitations of cloud computing
2. Identify the architecture, infrastructure and delivery models of cloud computing
3. Apply suitable virtualization concept.
4. Choose the appropriate cloud player , Programming Models and approach.
5. Address the core issues of cloud computing such as security, privacy and interoperability
6. Design Cloud Services and Set a private cloud

Unit 1

Cloud Computing Overview – Origins of Cloud computing – Cloud components - Essential characteristics – On-demand self-service, Broad network access, Location independent resource pooling, Rapid elasticity, Measured service

Unit II

Cloud scenarios – Benefits: scalability, simplicity , vendors ,security. Limitations – Sensitive information - Application development – Security concerns - privacy concern with a third party - security level of third party - security benefits Regularity issues: Government policies

Unit III

Cloud architecture: Cloud delivery model – SPI framework , SPI evolution , SPI vs. traditional IT Model

Software as a Service (SaaS): SaaS service providers – Google App Engine, Salesforce.com and google platform – Benefits – Operational benefits - Economic benefits – Evaluating SaaS
Platform as a Service (PaaS): PaaS service providers – Right Scale – Salesforce.com – Rackspace – Force.com – Services and Benefits

Andhra Pradesh State Council of Higher Education
B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS
w.e.f.2017-2018

Structure of Computer Science/Information Technology (IT) Syllabus

Unit IV

Infrastructure as a Service (IaaS): IaaS service providers – Amazon EC2 , GoGrid – Microsoft soft implementation and support – Amazon EC service level agreement – Recent developments – Benefits

Unit V

Virtualization: Virtualization and cloud computing - Need of virtualization – cost , administration , fast deployment , reduce infrastructure cost - limitations

Types of hardware virtualization: Full virtualization - partial virtualization - para virtualization

Reference Books

1. Cloud computing a practical approach - Anthony T.Velte , Toby J. Velte Robert Elsenpeter TATA McGraw- Hill , New Delhi - 2010
2. Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online - Michael Miller - Que 2008
3. Cloud Computing, Theory and Practice, Dan C Marinescu, MK Elsevier.
4. Cloud Computing, A Hands on approach, Arshadeep Bahga, Vijay Madiseti, University Press
5. Mastering Cloud Computing, Foundations and Application Programming, Raj Kumar Buyya, Christenvecctiola, S Tammarai selvi, TMH

Student Activity:

1. Prepare the list of companies providing cloud services category wise.
 2. Create a private cloud using local server
-

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CBCS – BSc(Computer Science) - III YEAR - SEMESTER-V
(Cluster C) Paper-VIII : Elective-II-2

CLOUD COMPUTING
MODEL QUESTION PAPER

Time: 3 Hours

Max. Marks : 75

SECTION-A

*Answer any **FIVE** of the following Questions:*

(5 x 5= 25 Marks)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

SECTION - B

*Answer any **FIVE** of the following Questions*

(5 × 10 =50 Marks)

- 11.
- 12.
- 13.
- 14.
- 15.
- 16.
- 17.
- 18.
- 19.
- 20.

Instruction to Paper Setter:

Two questions must be given from each unit in Section-A and Section-B

Structure of Computer Science/Information Technology (IT) Syllabus

III YEAR VI SEMESTER
(Cluster C) Paper-VIII : Elective –II-2

CLOUD COMPUTING LAB

- 1) Use Eucalyptus or Open Nebula or equivalent to set up the cloud and demonstrate.
 - i. Find procedure to run the virtual machine of different configuration. Check how many virtual machines can be utilized at particular time.
 - ii. Find procedure to attach virtual block to the virtual machine and check whether it holds the data even after the release of the virtual machine.
 - iii. Install a C compiler in the virtual machine and execute a sample program.
 - iv. Show the virtual machine migration based on the certain condition from one node to the other.
 - v. Find procedure to install storage controller and interact with it.
- 2) Creating a Warehouse Application in Sales Force.com.
- 3) Creating an Application in Sales Force.com using Apex programming Language.
- 4) Implementation of SOAP web services in C#/ JAVA Applications.
- 5) Implementation of Para- Virtualization using VM ware's workstation/ Oracle's Virtual Box and Guest O.S.
- 6) Case study: PAAS (Face book, Google App Engine)
- 7) Case Study: Amazon web services.

Structure of Computer Science/Information Technology (IT) Syllabus

PROJECT & VIVA-VOCE

The objective of the project is to motivate them to work in emerging/latest technologies, help the students to develop ability, to apply theoretical and practical tools/techniques to solve real life problems related to industry, academic institutions and research laboratories.

The project is of 5 hours/week for one (semester VI) semester duration and a student is expected to do planning, analyzing, designing, coding, and implementing the project. The initiation of project should be with the project proposal. The synopsis approval will be given by the project guides.

The project proposal should include the following:

- Title
- Objectives
- Input and output
- Details of modules and process logic
- Limitations of the project
- Tools/platforms, Languages to be used
- Scope of future application

The Project work should be either an individual one or a group of not more than three members and submit a project report at the end of the semester. The students shall defend their dissertation in front of experts during viva-voce examinations.

EVALUATION OF PROJECT

Project Work – 3 Credits

Dissertation – 2 Credits

Ude Bad
B. S. Kumar