
BASIC CIRCUIT THEORY

UNIT- 1: (12Hrs)

SINUSOIDAL ALTERNATING WAVEFORMS:

Definition of current and voltage. The sine wave, general format of sine wave for voltage or current, phase relations, average value, effective (R.M.S) values. Differences between A.C and D.C. **Basic elements and phasors:** Basic Response of R, L & C elements, frequency response of basic elements. **(problems)**

UNIT-II: (12hrs)

PASSIVE NETWORKS: (D.C)

Kirchhoff's current and Voltage Law's ,Resistor, Capacitor, and Inductor, series and parallel networks. Branch current method, Mesh Analysis, Nodal Analysis, star to delta & delta to star conversions.

UNIT-III: (14hrs)

NETWORKS THEOREMS: (D.C)

Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power, Milliman and Reciprocity theorems **(problems)**.

UNIT-IV: (12hrs)

RC AND RL CIRCUITS:

Transient response of RL and RC circuits with step input, Time constants, Frequency response of RC and RL circuits, their action as low pass, high pass and Band pass filters. Passive differentiating and integrating circuits. (problems)

UNIT-V: (10hrs)

SERIES AND PARALLEL RESONANCE CIRCUITS:

Series resonance and parallel resonance circuits, Q - Factor, Selectivity and band width, Comparison of series and parallel resonance, Tank circuit-LC oscillations.

TEXT BOOKS:

1. Introductory circuit Analysis (UBS Publications) ---- **Robert L. Boylestad.**
2. Electronic Devices and Circuit Theory --- **Robert L. Boylestad & Louis Nashelsky.**
3. Circuit Analysis by **P.Gnanasivam- Pearson Education**

REFERENCE BOOKS:

1. Engineering Circuit Analysis **By: Hayt & Kemmerly - MG.**
2. Networks and Systems – **D.Roy Chowdary.**
3. Unified Electronics (Circuit Analysis and Electronic Devices) **by Agarwal-Arora**
4. Electric Circuit Analysis- **S.R. Paranjothi-** New Age International.

ELECTRONICS LAB-1

(CIRCUIT LAB)

Demonstration of C.R.O: Demonstration using CRO Kit - Block diagram concepts etc., in lab session (Using slides.)

(Assignments are to be given-Marks shall be allotted to this work as internal part.)

LAB LIST: any six experiments

1. Measurements of D.C & A.C voltage, frequency using CRO
2. Verification of Kirchhoff's laws
3. Thevenin's Theorem-verification
4. Norton's Theorem-verification
5. Maximum Power Transfer Theorem-verification
6. RC circuit-Frequency response (low and High pass)
7. RL circuit-Frequency response (low and High pass)
8. LCR series resonance circuits-Frequency response-Determination of Q and Band Width.
- 9.LCR parallel resonance circuits-Frequency response-Determination of Q and Band width

Lab experiments are to be done on breadboard and simulation software (using multisim) and output values are to be compared and justified for variation.

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.

THREE YEAR (CBCS) DEGREE EXAMINATION
FIRST YEAR SEMESTER –I
SUB: ELECTRONICS
PAPER-I : BASIC CIRCUIT THEORY
MODEL PAPER

Time : 3hours

Max marks : 75

PART - A

Answer any FIVE questions. Each question carries 5 Marks. 5 X 5 = 25M

- 1) Explain the Sinusoidal wave representation of an alternating voltage signal.
- 2) Derive an expression for Average value of AC sinusoidal signal.
- 3) Explain about Node Voltage method in a circuit having two loops and two energy sources.
- 4) Derive the expressions for the total inductance, when the two inductors L_1 and L_2 connected in series and in parallel.
- 5) State and prove Millman's theorem.
- 6) State and prove Reciprocity theorem.
- 7) Explain about Band pass filter.
- 8) Explain the working of R-C circuit as an integrator.
- 9) Distinguish between LCR series and parallel resonance circuits.
- 10) Explain about the working of a Tank circuit.

PART-B

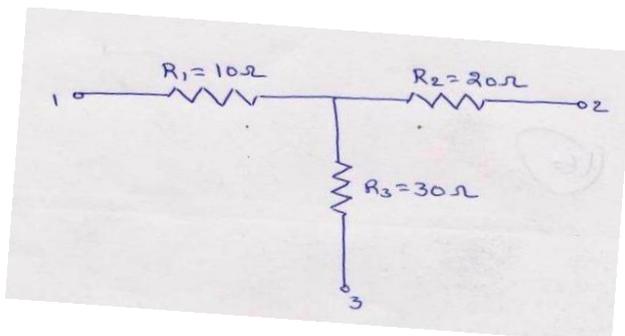
Answer any FIVE questions. Each question carries 10 Marks. 5 X 10 = 50 M

UNIT-I

- 11) Derive the expressions for the phase relation between Voltage and Current in an Inductor and in a capacitor.
- 12) Explain the differences between AC and DC.

UNIT-II

- 13) State and explain Kirchhoff's laws.
- 14) A) Explain about Star to Delta conversion in detail.
B) Convert the following Star network into its equalent Delta network.



UNIT-III

- 15) State and prove Maximum power transfer theorem.
- 16) State and prove Thevenin's Theorem.

UNIT-IV

- 17) Explain the Transient Response of R – C circuit with Step Input.
- 18) Explain the frequency response of R – L low pass and high pass filters.

UNIT-V

- 19) Draw the circuit diagram of LCR series resonance circuit and explain its working. Also derive the expressions for its Resonant frequency, Impedance at resonance, Band Width, Q-factor and Selectivity
- 20) Draw the circuit diagram of LCR parallel resonance circuit and explain its working. Also derive the expressions for its Resonant frequency, Impedance at resonance, Band Width, Q-factor and Selectivity.

Electronic Devices and Circuits

UNIT 1: (12Hrs)

PN JUNCTION DIODES:

P-N junction Diode, Depletion region, Barrier Potential, Working in Forward and Reverse bias condition – Junction capacitance, Diode current equation – Effect of temperature on reverse saturation current – construction, working, V-I characteristics and simple applications of varactor diode, Zener diode and Tunnel diode.

UNIT –II:(12hrs)

BIPOLAR JUNCTION TRANSISTOR AND ITS BIASING: (D.C)

Introduction, Transistor Construction, Operation, and characteristics of CB, CE, and CC – Configurations. Complete hybrid equivalent model for low frequency Transistor as a switch

BJT Biasing: Fixed-Bias Circuit, Emitter-Stabilized Bias Circuit, Voltage-Divider Bias, Bias Stabilization.

UNIT-III:(16hrs)

FIELD EFFECT TRANSISTORS , UJT & SCR:

Introduction, Construction, Operation and Characteristics of FET/JFET, Drain and Transfer characteristics, Depletion-type, and Enhancement-Type MOSFETs.

FET Biasing: Fixed-Bias Configuration, Self-Bias Configuration, Voltage-Divider Biasing, UJT construction-working, V-I characteristics, UJT as a Relaxation oscillator.

Silicon Controlled Rectifier (SCR):

Structure and working of SCR. Two transistor representation, Characteristics of SCR. Experimental set up to study the SCR characteristics, Application of SCR for power control.

UNIT IV: (08hrs)

PHOTO ELECTRIC DEVICES:

Light-Emitting Diodes (LEDs), IR Emitters, Photo diode, Photo transistors, Structure and operation of LDR, and Opto-Isolators.

UNIT-V:(12hrs)

POWER SUPPLIES:

Rectifiers::Half wave, full wave and bridge rectifiers-Efficiency-ripple factor-Regulation, Types of filter-choke input(inductor) filter, shunt, L-section & π -section filters. Three terminal fixed voltage I.C. regulators (78XX and 79XX)-Principle and working of SMPS (switch mode power supplies)

TEXT BOOKS:

1. Electronic Devices and Circuit Theory --- **Robert L. Boylestad & Louis Nashelsky.**
2. Electronic Devices and Circuits I – **T.L.Floyd- PHI Fifth Edition**

REFERENCE BOOKS:

1. Integrated Electronics – **Millman & Halkias.**
2. Electronic Devices & Circuits – **Bogart.**
3. Sedha R.S., A Text Book Of Applied Electronics, S.Chand & Company Ltd

ELECTRONICS LAB-2
(ELECTRONIC DEVICES AND CIRCUITS LAB)

LAB LIST:

Any six experiments

1. V-I Characteristics of junction diode
2. V-I Characteristics of zener diode
3. Regulated power supply using zener diode
4. BJT input and output characteristics
5. FET input and output characteristics
6. UJT characteristics
7. LDR characteristics
8. IC regulated power supply(IC-7805)
9. V-I characteristics of SCR.

Lab experiments are to be done on breadboard and simulation software (using multisim) and output values are to be compared and justified for variation.

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.
THREE YEAR (CBCS) DEGREE EXAMINATION
FIRST YEAR SEMESTER –II
SUB: ELECTRONICS
PAPER-II : ELECTRONIC DEVICES AND CIRCUITS
MODEL PAPER

Time : 3hours

Max marks : 75

PART - A

*Answer any **FIVE** questions. Each question carries 5 Marks. 5 X 5 = 25M*

- 1) Write a short note on Varactor Diode.
- 2) Explain the effect of temperature on reverse saturation current.
- 3) Explain the working of a p-n-p transistor.
- 4) Explain the working of transistor as a switch.
- 5) Explain the working of UJT as a Relaxation Oscillator.
- 6) “SCR used for power control” explain.
- 7) Explain the characteristics of a photo transistor.
- 8) What is photo electric effect? Explain about Opto-Isolators.
- 9) Draw the circuit diagram of a Half Wave Rectifier and explain its working.
- 10) Explain about three terminal IC voltage regulators.

PART-B

*Answer **ONE** question from each unit. Each question carries 10 Marks 5 X 10 = 50M*

UNIT-I

- 11) Explain the construction, working and V – I characteristics of a P – N junction diode.

(OR)

- 12) What is Tunneling? Explain the working and V – I characteristics of a Tunnel diode.

UNIT-II

- 13) Draw the experimental arrangement to study the input and output characteristics of a CE transistor. Also explain cutoff, saturation and active regions.

(OR)

- 14) What is Biasing? Explain about Fixed bias of a CE transistor.

UNIT-III

- 15) Explain the construction, working and characteristics of JFET.

(OR)

- 16) Explain the two transistor working and characteristics of SCR.

UNIT-IV

- 17) Explain the construction and working of LED.

(OR)

- 18) Explain the working and characteristics of LDR.

UNIT-V

- 19) Explain the working of Full Wave Rectifier. Also derive the expression for its efficiency and ripple factor.

(OR)

- 20) Draw and explain the block diagram of Switch Mode Power Supply (SMPS).

Digital Electronics

Unit – I (9hrs)

NUMBER SYSTEM AND CODES: Decimal, Binary, Hexadecimal, Octal, BCD, Conversions, Complements (1's, 2's, 9's and 10's), Addition, Subtraction, Gray, Excess-3 Code conversion from one to another.

Unit- II (12hrs)

BOOLEAN ALGEBRA AND THEOREMS: Boolean Theorems, De-Morgan's laws. Digital logic gates, Multi level NAND & NOR gates. Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh Map Method: 3,4 variables), don't care condition.

Unit-III (15hrs)

COMBINATIONAL DIGITAL CIRCUITS:

Adders-Half & full adder, Subtractor-Half and full subtractors, Parallel binary adder, Magnitude Comparator, Multiplexers (2:1,4:1) and Demultiplexers (1:2,4:1), Encoder (8-line-to-3-line) and Decoder (3-line-to-8-line). IC-LOGIC FAMILIES: TTL logic, DTL logic, RTL Logic, CMOS Logic families (NAND&NOR Gates), Bi-CMOS inverter

UNIT-IV (14hrs)

SEQUENTIAL DIGITAL CIRCUITS:

Flip Flops: S-R FF, J-K FF, T and D type FFs, Master-Slave FFs, Excitation tables, Registers:-shift left register, shift right register, Counters - Asynchronous-Mod16, Mod-10, Mod-8, Down counter, Synchronous-4-bit & Ring counter.

UNIT-V (10hrs)

MEMORY DEVICES:

General Memory Operations, ROM, RAM (Static and Dynamic), PROM, EPROM, EEPROM, EAROM, PLA(Programmable logic Array), PAL(Programmable Array Logic)

TEXT BOOKS:

1. M.Morris Mano, "Digital Design" 3rd Edition, PHI, New Delhi.
2. Ronald J. Tocci. "Digital Systems-Principles and Applications" 6/e. PHI. New Delhi. 1999.(UNITS I to IV)
3. G.K.Kharate-Digital electronics-oxford university press
4. S.Salivahana&S.Arivazhagan-Digital circuits and design
5. Fundamentals of Digital Circuits by Anand Kumar

Reference Books :

1. Herbert Taub and Donald Schilling. "Digital Integrated Electronics" . McGraw Hill. 1985.
2. S.K. Bose. "Digital Systems". 2/e. New Age International. 1992.
3. D.K. Anvekar and B.S. Sonade. "Electronic Data Converters : Fundamentals & Applications". TMH. 1994.
4. Malvino and Leach. "Digital Principles and Applications". TMG Hill Edition.

ELECTRONICS LAB-3

(DIGITAL ELECTRONICS LAB)

LAB LIST:

Any six experiments

1. Verification of IC-logic gates
2. Realization of basic gates using discrete components (resistor, diodes & transistor)
3. Realization of basic gates using Universal gates (NAND & NOR gates)
4. Verify Half adder and full adder using gates
5. Verify Half subtractor and full subtractor using gates.
6. Verify the truth table of RS , JK, T-F/F using NAND gates
7. 4-bit binary parallel adder and subtractor using IC 7483
8. BCD to Seven Segment Decoder using IC -7447/7448
9. Verification of Demorgan's Laws.

Lab experiments are to be done on breadboard and simulation software (using multisim) and output values are to be compared and justified for variation.

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.

THREE YEAR (CBCS) DEGREE EXAMINATION
SECOND YEAR SEMESTER –III
SUB: ELECTRONICS
PAPER-III : DIGITAL ELECTRONICS
MODEL PAPER

Time : 3hours

Max marks : 75

PART - A

Answer any FIVE questions. Each question carries 5 Marks.

5 X 5 = 25M

- 1) What is a Gray Code? Explain the conversion of a Binary code to Gray code with an example.
- 2) Subtract $111011_{(2)}$ from $111100_{(2)}$ using 2's complement method.
- 3) Explain about Sum Of Products (SOP) and Product of Sums(POS) of Boolean Expressions.
- 4) State and explain Demorgan's Laws.
- 5) Explain about Half Adder.
- 6) Explain about CMOS NAND gate.
- 7) What is a Flip flop? Explain about D - Flip flop.
- 8) Explain about Ring counter.
- 9) What is memory? Explain about memory operations.
- 10) Explain the working of Dynamic RAM.

PART-B

Answer ONE question from each unit. Each question carries 10 Marks. 5 X 10 = 50 M

UNIT-I

11) Convert the following codes

A) $125.25_{(10)} = \text{_____}_{(2)}$ B) $11111101.111_{(2)} = \text{_____}_{(10)}$

(OR)

12) Explain about BCD and Excess – 3 codes.

UNIT-II

13) Draw the symbols and truth tables of AND, OR, NOT, NAND and NOR Gates.

(OR)

14) Simplify $f(A,B,C,D) = \sum m (0,1,2,4,5,7,8,10,12,13,14)$.

UNIT-III

15) Explain about a Full Subtractor. Derive the expressions for its Difference and Barrow.

(OR)

16) Explain about Multiplexers and Demultiplexers.

UNIT-IV

17) Explain about J-K flip flop.

(OR)

18) Explain about Decade (MOD – 10) counter.

UNIT-V

19) What is a Programmable Logic Array? Draw and explain the Organization of PLA.

(OR)

20) What is PROM? Draw the organization of PROM for a Full Adder.

B.Sc. Electronics Syllabus under CBCS
w.e.f. 2015-16 (revised in April 2016)

SEMESTER – IV

PAPER – 4

Analog and Digital ic-applications

Unit – I (10hrs)

OPERATIONAL AMPLIFIERS: Definition, Basic op-amp Ideal op-amp, Block diagram of op-amp, inverting, noninverting, virtualground, Adders, subtractors, summing amplifier, voltage follower, op-amp parameters, voltage to current convertor ,integrator, differentiator, differential amplifier, Logarithmic amplifier.

Unit- II (15 hrs)

OP-AMP CIRCUITS: voltage regulator, comparator ,zerocross detecting circuit, instrumentational amplifier, multivibrators-astable, monostable, Bi-stable, Schmitt trigger. sine wave generator, square wave generator, triangular wave generator, Active filters(Basics)-low pass, high pass, band pass filters

IC-555 –functional block diagram and mention it's applications

Unit-III (15hrs):

COMBINATIONAL & SEQUENTIAL LOGIC CIRCUITS (IC-Applications):

Design of Code convertor: BCD to Seven Segment ,BCD to Grey, Grey to Binary.

Design of Counters using State Machine: Mod N counter, Preset Table,Binary Up/Down Counter. Design of Universal Shift Register

UNIT-IV (10hrs) DATA

CONVERTERS:

A/D converter:- Successive Approximation ADC,-Single slope and dual slope converter, Sigma-delta ADC, D/A converter: R-2R Ladder network, Binary Weighted .

UNIT-V (10hrs)

DIGITAL SYSTEM INTERFACING AND APPLICATIONS: interfacing of LED's

Applications of Counters: Digital Clock

Applications of Shift Registers: Parallel to Serial ,Serial to Parallel, UART

TEXT BOOKS:

1. G.K.Kharate-Digital electronics-oxford university press
2. M.Morris Mano, “ Digital Design “ 3rd Edition, PHI, New Delhi.
3. Op Amp and Linear Integrated Circuits By Ramakant Gaykwad
4. Linear Integrated Circuits By Roy Choudary

Reference Books :

1. Jacob Millan ,Micro Electronics,McGraw Hill.
2. Mithal G K, Electronic Devices and Circuits Thana Publishers.
3. Allan Motter shead ,Electronic Devices and Circuits – An Introduction- Prentice Hall

Electronics Lab - 4**(Analog and digital ic-applications)****LAB LIST:****Any six experiments**

1. Op-Amp as inverting and non-inverting
2. Op-Amp as integrator and differentiator
3. Op-Amp as adder & subtractor
4. Op-Amp as voltage to current converter
5. Op-Amp as sine wave generator (Wien bridge oscillator)
6. Op-Amp as square wave generator
7. Astable multivibrator determination of frequency (using IC-555)
8. Schmitt trigger using IC-555 timer.
9. Binary to Gray and Gray to binary converter.
10. Study of Perishable binary up/down counter.
11. BCD to seven segment decoder using IC 7447/7448.

Lab experiments are to be done on breadboard and simulation software (using multisim) and output values are to be compared and justified for variation.

VIKRAMA SIMHAPURI UNIVERSITY :: NELLORE.
THREE YEAR (CBCS) DEGREE EXAMINATION
SECOND YEAR SEMESTER –IV
SUB: ELECTRONICS
PAPER-IV : ANALOG AND DIGITAL IC APPLICATIONS
MODEL PAPAER

Time : 3hours

Max marks : 75

PART - A

*Answer any **FIVE** questions. Each question carries 5 Marks.*

5 X 5 = 25M

- 1) What are the characteristics of an ideal OP-AMP.
- 2) Explain the working of OP-AMP as an integrator.
- 3) Explain OP-AMP as a comparator.
- 4) Explain the operation and frequency response of a band pass filter using OP-AMP.
- 5) Design Gray code to binary code converter.
- 6) Draw the circuit diagram of MOD – 10 counter.
- 7) Explain about single slope ADC.
- 8) Explain binary weighted resistor type DAC.
- 9) Write a short note on interfacing of LED.
- 10) Explain about serial in parallel out shift register.

PART-B

*Answer **ONE** question from each unit. Each question carries 10 Marks. 5 X 10 = 50 M*

UNIT-I

- 11) Draw the block diagram of Operational amplifier and explain its wirking.
(OR)
- 12) Discuss the parameters of OP-AMP.

UNIT-II

- 13) Explain the working of OP-AMP as an Astable Multivibrator.
(OR)
- 14) Draw and explain the functional block diagram of IC 555.

UNIT-III

- 15) Design BCD to Seven segment display converter.
(OR)
- 16) Explain about Universal shift register.

UNIT-IV

- 17) Discuss about successive approximation type ADC.
(OR)
- 18) Explain about R – 2R ladder type DAC.

UNIT-V

- 19) Explain the designing and operation of a Digital Clock.
(OR)
- 20) Explain about Universal Asynchronous Receiver and Transmitter (UART).

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION

B.Sc. Electronics CBCS SYLLABUS
B. Sc ELECTRONICS SYLLABUS (2017-18)

3rd YEAR

V SEMESTER

PAPER-V

ANALOG AND DIGITAL COMMUNICATIONS

PAPER-VI

MICROPROCESSOR SYSTEMS

VI SEMESTER

PAPER-VII

MICRO CONTROLLER AND INTERFACING

Cluster-1

PAPER- VIII (A1)

EMBEDDED SYSTEMS DESIGN

PAPER- IX (A2)

ELECTRONIC INSTRUMENTATION

PAPER- X (A3)

POWER ELECTRONICS

Cluster-2

PAPER-B

PC MAINTAINANCE AND TROUBLE SHOOTING

PAPER- VIII (B1)

COMPUTER NETWORKS

PAPER- IX (B2)

CONSUMER ELECTRONICS

PAPER- X (B3)

OPTICAL FIBER COMMUNICATION AND IT'S APPLICATION

LABS:

LAB-5: COMMUNICATION LAB

LAB-6: MICROPROCESSOR LAB

LAB-7: MICROCONTROLLER LAB

LAB-8: ELECTRONIC INSTRUMENTATION LAB

LAB-9:POWER ELECTRONICS LAB

LAB-10- PROJECT WORK.

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION
B.Sc. Electronics CBCS Syllabus

3RD YEAR

Semester - V

Paper- V

TITLE: ANALOG AND DIGITAL COMMUNICATIONS

OBJECTIVES:

- This course provides a thorough introduction to the basic principles and techniques used in analog and digital communications.
- The course will introduce analog and digital modulation techniques.
- Communication receiver and transmitter design, baseband and band pass communication techniques, line coding techniques, noise analysis, and multiplexing techniques.
- The course also introduces analytical techniques to evaluate the performance of communication systems.

UNIT –I (10Hrs)

AMPLITUDE MODULATION:

Need for modulation, amplitude modulation-frequency spectrum of AM wave, representation of AM, power relations in the AM wave. Generation of AM - Transistor modulators. Suppression of carrier, balanced modulator, suppression of one side band- phase shift method.

UNIT –II (10Hrs)

FREQUENCY MODULATION:

Theory of FM, mathematical representation of FM, frequency spectrum of FM wave, Generation of FM signals – Basic Reactance modulator.

UNIT –III (10Hrs)

BASIC RECEIVER CIRCUITS:

Receiver parameters: sensitivity, fidelity, selectivity. Super heterodyne Receiver block diagram, FM receiver, FM discriminators- balanced slope.

UNIT –IV (12Hrs)

RADIO WAVE PROPAGATION:

Communication bands, Electromagnetic waves, propagation of waves - ground waves, Ionosphere & Space waves. **PULSE MODULATION:** Introduction, Sampling Theorem, TDM, FDM, PAM- Generation & Detection PWM- Generation & Detection, PPM- Generation & Detection

UNIT –V (18Hrs)

DIGITAL COMMUNICATIONS:

PCM generation and detection, Advantages of digital over analog communications. Advantages of shift keying over digital communication, Types of shift keying, ASK – Generation & Detection, FSK – Generation & Detection, PSK – Generation & Detection.

TEXT BOOKS:

1. Electronic Communications - George Kennedy
2. Antennas and Wave Propagation – G.S.N.Raju – PHI
3. Principles of communication system –Herbert Taub & D.L.Schilling

REFERENCES:

1. Electronic Communications – Roody & Colen
2. Communication Systems – Hayken --- 4th Edition
3. Advance Electronic communication system ---Tomasi wayne
4. Modern digital and analog communication system –B.P.lathi

OUTCOMES:

On successful completion of the course students will be able to:

- The student can gain good knowledge on analog and digital communication
- Understand basic elements of a communication system
- Conduct analysis of baseband signals in time domain and in frequency domain
- Demonstrate understanding of various analog and digital modulation and demodulation techniques techniques.
- Analyse the performance of modulation and demodulation techniques in various transmission environments

ELECTRONICS LAB-V

COMMUNICATION LAB

LAB LIST:

1. AMPLITUDE MODULATION
2. AMPLITUDE DE-MODULATION
3. FREQUENCY MODULATION
4. FREQUENCY DE-MODULATION
5. PRE-EMPHASIS CIRCUIT
6. DE-EMPHASIS CIRCUIT
7. PULSE AMPLITUDE MODULATION
8. PULSE WIDTH MODULATION.
9. PULSE POSITION MODULATION
10. PULSE CODE MODULATION

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION
B.Sc. Electronics CBCS Model Paper

3RD YEAR

Semester - V

Paper- V

TITLE: ANALOG AND DIGITAL COMMUNICATIONS

SECTION-A

Answer any FIVE of the following: **5x5=25M**

1. Explain about need for modulation.
2. Obtain the power relations in AM wave.
3. Define the following terms in FM wave
(i) Carrier Swing (ii) Frequency Deviation (iii) modulation index.
4. Explain the frequency spectrum of FM wave.
5. Explain the parameters: Selectivity and Sensitivity of a radio receiver.
6. What is the principle involved in a superhetrodyne receiver.
7. Explain about propagation of waves.
8. Explain about the generation of Pulse Position Modulation (PPM).
9. What are the advantages of Digital over Analog communications?
10. Explain about PSK.

SECTION-B

Answer any FIVE of the following: **5x10=50M**

11. Define amplitude modulation and explain about frequency spectrum of AM wave.
12. Explain about Suppression of one side band using phase shift method.
13. What is Frequency Modulation? Explain the mathematical analysis of FM wave.
- 14) Explain how FM signals are generated using reactance modulator.
- 15) Draw and explain the block diagram of a superhetrodyne receiver-AM
- 16) Discuss about the construction and working of Balanced slope detector.
- 17) Explain the block diagram of PAM and briefly explain each block.
- 18) Explain about Time Division Multiplexing (TDM).
- 19) Explain the block diagram of PCM in detail.
- 20) Discuss briefly about Amplitude shift keying(ASK) .

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION
B.Sc. Electronics CBCS Syllabus

3RD YEAR

Sub: ELECTRONICS		Year:2017-18	Group: B.Sc (M.E.Cs)	Credits - 3
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Semester-V

Paper- VI

TITLE: MICROPROCESSOR SYSTEMS

OBJECTIVES:

- To understand basic architecture of 16 bit and 32 bit microprocessors.
- To understand interfacing of 16 bit microprocessor with memory and peripheral chips involving system design.
- To understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors
- To understand RISC based microprocessors.
- To understand concept of multi core processors.

UNIT -I: (15Hrs)

CPU ARCHITECTURE

Introduction to Microprocessor, INTEL -8085(μ P) Architecture, CPU, ALU unit, PSW, Register organization, Address, data and control Buses. Pin configuration of 8085.

UNIT -II: (10 Hrs)

8086 Architecture, Evaluation of Microprocessor, Internal operation, Pin description. Instruction format, Machine language instructions, Instruction Execution timing, Addressing modes

UNIT -III: (15Hrs)

INSTRUCTION SET:Data transfer Instruction, Logical Instructions, Arithmetic Instructions, Branch Instructions, Flag Manipulation , Shift and rotate Instruction, Loop Instruction

UNIT -IV: (10Hrs)

Assembly Language Programming, Programmes for Addition, Subtraction, Multiplication , Find the largest and smallest number in an array

UNIT -V: (10Hrs)

Basic 8086 Configurations – Minimum mode and Maximum Mode, Interrupt Priority Management, I/O Interfaces: Serial Communication interfaces, Parallel Communication, DMA controller

TEXT BOOKS:

1. Microcomputer Systems the 8086/8088 family – YU-Cheng Liu and Glenn SA Gibson
2. Microcontrollers Architecture Programming, Interfacing and System Design
– **Raj Kamal Chapter: 15.1, 15.2, 15.3, 15.4.1**
- 3.8086 and 8088 Microprocessor by Tribel and avatar singh

REFERENCES:

1. Microprocessors and Interfacing – Douglas V.Hall
2. Microprocessor and Digital Systems – Douglas V. Hall
3. Advanced Microprocessors & Microcontrollers - B.P.Singh & Renu Singh – New Age
4. The Intel Microprocessors – Architecture, Programming and Interfacing – Bary B. Brey.
5. Arm Architecture reference manual –Arm ltd.

OUTCOMES:

- The student can gain good knowledge on microprocessor and implement in practical applications
- Design system using memory chips and peripheral chips for 16 bit 8086 microprocessor.
- Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors.
- Understand multi core processor and its advantages

ELECTRONICS LAB-VI

MICROPROCESSOR LAB

LAB LIST:

1. PROGRAM TO ADD TO DECIMAL NUMBERS
2. SUBTRACTION OF TWO DECIMAL NUMBERS
3. ADD TWO WORDS IN MEMORY LOCATION AND STORE THE RESULT IN SUBSEQUENT MEMORY LOCATION
4. TO INTERCHANGE TWO WORDS FROM 4100 AND 4102 LOCATION
5. PROGRAM TO COMPUTE LOGICAL ONES IN A WORD AND STORE THE RESULT IN MEMORY
6. PROGRAM TO CONVERT TWO BCD NUMBERS IN TO HEX
7. PROGRAM TO CONVERT HEX NUMBER IN TO BCD NUMBER.
8. PROGRAM TO FIND THE SQUARE ROOT OF A GIVEN NUMBER.
9. Interfacing Experiments using 8086 microprocessor (DEMO):
 1. Traffic Light Controller
 2. Elevator,
 3. 7-segment display

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION
B.Sc. Electronics CBCS MODEL PAPER

3RD YEAR

Sub: ELECTRONICS		Year:2017-18	Group: B.Sc (M.E.Cs)	Credits - 3
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Semester-V

Paper- VI

TITLE: MICROPROCESSOR SYSTEMS

SECTION-A

Answer any FIVE of the following:

5x5=25M

1. Describe the flag register of 8085.
2. Explain about address, data and control buses.
3. Write about instruction format of 8086.
4. Explain the evaluation of 8086 microprocessor.
5. Write short notes on shift and rotate instructions.
6. Explain about Flag manipulation instructions.
7. Write an assembly language program for addition of two numbers.
8. Write an assembly language program for multiplication of two numbers.
9. Explain the minimum mode and maximum modes of 8086 microprocessor.
10. Compare series communication and parallel communication systems.

SECTION-B

Answer any FIVE of the following:

5x10=50M

11. Explain the functional block diagram of 8085 microprocessor.
12. Draw and explain the pinout diagram of 8085 microprocessor.
13. Draw the architecture of 8086 microprocessor and explain the function of each block.
14. Explain the addressing modes of 8086 microprocessor.
15. Explain about Arithmetic and Logical instructions.
16. Explain about Data transfer and branch instructions.
17. Write an assembly language program to find the largest element from the given array of elements.
18. Write an assembly language program for Division of two numbers.
19. What is an interrupt? Explain about interrupt priority management.
20. What is DMA? Explain about DMA controller.

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION

B.Sc. Electronics CBCS Syllabus

3RD YEAR

VI SEMESTER

PAPER-VII

MICRO CONTROLLER AND INTERFACING

Sub: ELECTRONICS		Year:2017 – 18	Group: B.Sc	Credits -3
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TITLE: MICRO CONTROLLER AND INTERFACING

OBJECTIVES:

- To understand the concepts of microcontroller based system.
- To enable design and programming of microcontroller based system.
- To know about the interfacing Circuits.

UNIT-I: (10Hrs)

Introduction, comparison of Microprocessor and micro controller, Evolution of microcontrollers from 4-bit to 32 bit. Overview and block diagram of 8051, Architecture of 8051, pin diagram of 8051.

UNIT -II: (10Hrs)

Microcontroller Architecture:

Program counter and memory organization, Data types and directives, PSW register, Register banks and stack, Port organization, Interrupts and timers.

UNIT-III:(10Hrs)

Addressing modes, instruction set of 8051: Addressing modes and accessing memory using various addressing modes, instruction set: Arithmetic, Logical, Simple bit, jump, loop and call instructions and their usage. Time delay generation and calculation, Timer/Counter Programming,

Unit -IV: (15Hrs)

Assemble language programming Examples: Addition, Multiplication, Subtraction, division, Finding the largest/smallest element from the given set of elements.

UNIT-V: (15Hrs)

Interfacing and Application of Microcontroller:

Interfacing of – Displaying information on a LCD, control of a stepper Motor , Interfacing a 4*4 matrix keypad. Generation of different types of waveforms (Square, Rectangular, Triangular, Saw tooth) using DAC.

TEXT BOOKS:

1. The 8051 microcontroller and embedded systems using assembly and c-kennet j.Ayalam, Dhananjay V.gadre, cengage publishers
- 2.The 8051 microcontrollers and Embedded systems - By Muhammad Ali Mazidi and Janice Gillispie Mazidi – Pearson Education Asia, 4th Reprint, 2002.

REFERENCE BOOKS:

1. Microcontrollers Architecture Programming, Interfacing and System Design – **Raj kamal**.
2. The 8051 Microcontroller Architecture, Programming and Application - **Kenneth J.Ajala** , west publishing company (ST PAUL, NEW YORK, LOS ANGELES, SAN FRANCISCO).
3. Microcontroller theory and application-Ajay V.Deshmukh

OUTCOMES:

- The student can gain good knowledge on microcontrollers and implement in practical applications
- learn Interfacing of Microcontroller
- get familiar with real time operating system

ELECTRONICS LAB-VII

MICROCONTROLLER LAB

(ANY 6 EXPERIMENTS)

LAB LIST:

- 1. ADDITION AND SUBTRACTION OF TWO 8-BIT NUMBERS.**
- 2. MULTIPLICATION AND DIVISION OF TWO 8-BIT NUMBERS.**
- 3. EXCHANGE OF HIGHER AND LOWER NIBBLES IN ACCUMULATOR.**
- 4. BCD OPERATION AND REVERSE AND X-OR OF GIVEN NUMBERS.**
- 5. FINDING THE LARGEST/SMALLEST ELEMENT FROM THE GIVEN SET OF ELEMENTS.**
- 6. INTERFACING STEPPER MOTOR.**
- 7. ADDITION OF TWO 8-BIT NUMBERS (KEIL SOFTWARE).**
- 8. ADDITION OF TWO 16-BIT NUMBERS (KEIL SOFTWARE)**
- 9. SUBTRACTION OF TWO 8-BIT NUMBERS (KEIL SOFTWARE).**
- 10. SUBTRACTION OF TWO 16-BIT NUMBERS (KEIL SOFTWARE).**
- 11. MULTIPLICATION OF TWO 8-BIT NUMBERS (KEIL SOFTWARE).**
- 12. PROGRAM FOR SWAPPING AND COMPLIMENT OF 8-BIT NUMBERS (KEIL SOFTWARE).**
- 13. PROGRAM TO FIND THE LARGEST NUMBER IN GIVEN ARRAY (KEIL SOFTWARE).**
- 14. PROGRAM TO FIND THE SMALLEST NUMBER IN GIVEN ARRAY (KEIL SOFTWARE).**
- 15. INTERFACING LED TO 8051 MICROCONTROLLER (KEIL SOFTWARE).**
- 16. INTERFACING BUZZER TO 8051 MICROCONTROLLER (KEIL SOFTWARE).**
- 17. INTERFACING RELAY TO 8051 MICROCONTROLLER (KEIL SOFTWARE).**
- 18. INTERFACING SEVEN SEGMENTS TO 8051 MICROCONTROLLER (KEIL SOFTWARE).**

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION
B.Sc. Electronics CBCS MODEL PAPER

3RD YEAR

VI SEMESTER

PAPER-VII

MICRO CONTROLLER AND INTERFACING

Sub: ELECTRONICS		Year:2017 – 18	Group: B.Sc	Credits -3
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TITLE: MICRO CONTROLLER AND INTERFACING

SECTION-A

Answer any FIVE of the following:

5x5=25M

1. Write about evolution of microcontrollers.
2. Compare Microprocessor and Microcontroller.
3. Explain about data types and assembler directives.
4. Explain about IE register.
5. Explain about arithmetic instructions (any 5).
6. Write an ALP to generate a square wave on port 2, pin 3.
7. Write an ALP to add two 8-bit numbers.
8. Write an ALP to multiply two 8-bit numbers.
9. Write an ALP to generate a Saw tooth wave form using DAC.
10. Explain the interfacing of 4*4 matrix key board with 8051 micro controller.

SECTION-B

Answer any FIVE of the following:

5x10=50M

- 11) Draw and explain the Architecture of 8051 microcontroller.
- 12) Draw the pin diagram of 8051 and explain each pin in detail.
- 13) Explain the Organization of RAM.
- 14) Explain about port organization of 8051.
- 15) Explain about different types of Addressing modes
- 16) Explain about (i) Data transfer instructions (ii) Logical instructions.
- 17) Write a ALP program on largest number in an array.
- 18) Write an ALP to Divide two 8-bit numbers.
- 19) Explain the interfacing of LCD with 8051 microcontroller.
- 20) Explain about interfacing of stepper motor to 8051 microcontroller.

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION
B. Sc ELECTRONICS SYLLABUS (2017-18)
3RD YEAR
VI SEMESTER

Cluster-1

PAPER- VIII (A1) EMBEDDED SYSTEMS DESIGN

TITLE: Embedded Systems Design

Sub: ELECTRONI	Year:2017-18	Group: B.Sc	Credits -3
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OBJECTIVES:

- design embedded computer system hardware
- design, implement, and debug multi-threaded application software that operates under real-time constraints on embedded computer systems
- use and describe the implementation of a real-time operating system on an embedded computer system
- formulate an embedded computer system design problem including multiple constraints, create a design that satisfies the constraints, implement the design in hardware and software, and measure performance against the design constraints
- create computer software and hardware implementations that operate according to well-known standards
- organize and write design documents and project reports
- organize and make technical presentations that describe a design.

UNIT 1: (10Hrs)

Introduction to Embedded Systems:

Embedded systems overview, Design Challenge, Processor Technology, IC Technology, and Design Technology.

UNIT 2: (15Hrs)

Custom Single Purpose Processor – Hardware Development:

Introduction, Combinational logic, Sequential logic, Custom Single Purpose Processor Design, RT-Level Custom Single-Purpose Processor.

UNIT 3: (15Hrs)

General Purpose Processor – Software Development:

Introduction, Basic Architecture, Operation, Programmer's View, ASIPs, and Development Environment: Host and Target Machines, Linker / Locators for Embedded Software, Getting Embedded Software into the target system. Debugging Techniques: Testing on your Host Machine, and Instruction Set Simulators.

UNIT 4: (10Hrs)

RTWA for Embedded Systems:

Introduction, Timers, Counters and Watchdog Timers, UART, Pulse Width Modulators, LCD Controllers, Keypad Controllers, Stepper Motor Controllers, Analog – to – Digital Converters, and Real Time Clocks.

UNIT 5: (10Hrs)

Advanced Communication Principles:

Parallel Communication, Serial Communication, Wireless Communication, **Serial Protocols:** I²C, CAN, FireWire, and USB. **Parallel Protocols:** PCI BUS and ARM BUS. **Wireless Protocols:** IrDA, Bluetooth, and IEEE 802.11.

TEXT BOOKS:

1. Embedded System Design – A Unified Hardware / Software Introduction By **Frank Vahid** / **Tony Givargis** – WILEY EDITION.
2. Embedded Systems Architecture, Programming and Design – 2nd Edition By **Raj Kamal** – Tata McGraw-Hill Education.

REFERENCES:

1. An Embedded Software Premier - **David E- Siman**, PEARSON Education
2. Embedded / real - time systems - **DR. K.V.K.K. Prasad**, dreamtech
3. The art of programming Embedded systems, **Jack G. Ganssle**, academic press
4. Intelligent Embedded systems, **Louis L. Odette, Adison Wesly**, 1991

OUTCOMES:

- The student can gain good knowledge on Embedded Systems and implement in practical applications.
- An ability effectively as a member or leader on a technical team
- A commitment to quality, timeliness and continuous improvement

PROJECT WORK-VIII

STUDENTS HAS TO DO A GROUP PROJECT WORK DURING THIRD YEAR

Title: Embedded systems Design

MODEL PAPER

SECTION-A

Answer any FIVE of the following: 5x5=25M

1. Write about embedded system.
2. Explain about Combinational logic.
3. Discuss about instruction set simulator.
4. Write about watchdog timers.
5. Write a short note on Bluetooth.
6. Explain about UART.
7. Explain about Linker/ Locators for Embedded software.
8. Write short notes on ARM bus.
9. Explain about IC technology.
10. Draw the pin diagram for Pulse width modulators.

SECTION-B

Answer any FIVE of the following: 5x10=50M

11. List various application areas of embedded systems and give examples for each application area?.
12. Explain about different technologies used in embedded systems.
13. Explain the design of custom single processor .
14. Discuss about RT-level custom single processor.
15. Explain about different debugging techniques
16. Describe the function of linker/locator for embedded software.
17. Interface ADC 0801 with 8051 to convert -5V -0 +5V analog voltage to digital equivalent, draw hardware and write appropriate program?.
18. Discuss briefly about Stepper motor controllers.
19. Briefly explain about serial communication.
20. Explain the following terms in brief (i)I²C (ii)CAN.

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION

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3rd YEAR

VI SEMESTER

PAPER- IX (A2)

ELECTRONIC INSTRUMENTATION

Sub: ELECTRONICS		Year:2017-18	Group: B.Sc	Credits -3
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TITLE: ELECTRONIC INSTRUMENTATION

OBJECTIVES:

The student will be introduced to

- To introduce students to monitor, analyze and control any physical system
- To understand students how different types of meters work and their construction
- To Study of absolute is merely confirmed within laboratories
- To Study integrating instruments like ammeter, voltmeter
- To Measurement of impedance using bridges
- To Study of PLL ,ph-meter, PLC

UNIT-I (10hrs)

Measurements:

Basic block diagram of measurement system, Accuracy and precision, resolution, sensitivity, linearity, Errors, systematic and random errors, standards & calibrations of an instrument.

Applications of instrument

UNIT –II (10hrs)

Basic Measurement Instruments: DC measurement-ammeter, voltmeter, ohm meter, AC measurement, Digital voltmeter systems (integrating and non-integrating). Digital Multimeter; Block diagram principle of measurement of I, V, C. Accuracy and resolution of measurement.

Measurement of Impedance- A.C. bridges, Measurement of Self Inductance (Anderson's bridge), Measurement of Capacitance (De Sauty bridge), Measurement of frequency (Wien's bridge).

UNIT-III (15hrs)

Lock-in-amplifier: Basic Principles of phase locked loop (PLL), Phase detector (XOR & edge triggered), Voltage Controlled Oscillator (Basics, varactor), lock and capture. Basic idea of PLL IC (565 or 4046). Lock-in-amplifier, Idea of techniques for sum and averaging of signals.

Signal Generators: Function generator, Pulse Generator, (Qualitative only).

UNIT-IV (15hrs)

Analytical instruments

Spectrophotometer, working with block diagram, features of spectrophotometer,

P_H meter - principle working with block diagram, features of **P_H** meter.

TEMPERATURE TRANSDUCERS

Standards and calibration, Fluid expansion and metal expansion type transducers, like bimetallic strip, Thermometer, RTD, Thermo couple and their characteristics.

UNIT-V : (10hrs)

Direct digital control (DDC), Distributed control system (DCS),

PLC'S: Block diagram, hardware, PLC operation, basic logic program (ladder logic),

Applications of PLC'S

TEXT BOOKS

1. Introduction to instrumentation and control By A.K.Ghosh
2. Sensors and transducers PHI 2Ed By D.Patranabis.
3. Industrial instrumentation –Eckman.P.
4. Instrument measurement analysis By Nakra and chaudhry.

Reference Books:

1. W.D. Cooper and A. D. Helfrick, Electronic Instrumentation and Measurement Techniques, Prentice Hall (2005).
2. E.O. Doebelin, Measurement Systems: Application and Design, McGraw Hill Book - fifth Edition (2003).
3. David A. Bell, Electronic Devices and Circuits, Oxford University Press (2015).
4. Alan S. Morris, "Measurement and Instrumentation Principles", Elsevier (Butterworth Heinmann-2008).

OUTCOMES:

- Design a system, component or process to meet desired needs in electrical engineering.
- Measurement of R,L,C ,Voltage, Current, Power factor , Power, Energy
- Ability to balance Bridges to find unknown values.
- .Ability to measure frequency, phase with Oscilloscope
- Ability to use Digital voltmeters
- Ability to measure strain, displacement, Velocity, Angular Velocity, temperature, Pressure ,Vacuum, and Flow

ELECTRONICS LAB-IX**ELECTRONIC INSTRUMENTATION LAB****LAB LIST:**

1. Design of multi range ammeter and voltmeter using galvanometer.
2. Measurement of resistance by Wheatstone bridge and measurement of bridge sensitivity.
3. Measurement of Capacitance by De'Sautys.
4. Measure of low resistance by Kelvin's double bridge.
5. To determine the Characteristics of resistance transducer - Strain Gauge (Measurement of Strain using half and full bridge.)
6. To determine the Characteristics of LVDT.
7. To determine the Characteristics of Thermistors and RTD.
8. Measurement of temperature by Thermocouples and study of transducers like AD590 (two terminal temperature sensor), PT-100, J- type, K-type.
9. To study the Characteristics of LDR, Photodiode, and Phototransistor.

Title: ELECTRONIC INSTRUMENTATION

MODEL PAPER

SECTION-A

Answer any FIVE of the following:

5x5=25M

1. Define the terms (i) Accuracy (ii) Precision
2. What is Digital multimeter?
3. Write a short note on lock in amplifier?
4. Explain about thermo couple and characteristics.
5. Write short notes on Temperature Transducer.
6. Mention some applications of PLC.
7. Define the terms (i) Resolution (ii) Sensitivity.
8. Explain about ohm meter.
9. What are the features of P_H meter.
10. Explain the measurement of inductance by using Anderson's bridge.

SECTION-B

Answer any FIVE of the following:

5x10=50M

11. Explain briefly about the block diagram of measurement system.
12. Define the following terms in brief :
(a) Systematic errors. (b) Random errors.
13. Explain about Digital voltmeter systems in brief.
14. Discuss briefly about measurement of frequency (Wien bridge) .
15. Define principle and working characteristics of PLL.
16. Explain briefly about function generator.
17. Draw the block diagram of Spectrophotometer and explain.
18. Define principle and working characteristics of P_H meter.
19. Discuss briefly about Direct digital control.
20. Explain about the block diagram of PLC and its operation.

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION
B.Sc. Electronics CBCS SYLLABUS
3rd YEAR
VI SEMESTER

Cluster-1

PAPER- X (A3) POWER ELECTRONICS

Sub: ELECTRONICS		Year:2017-18	Group: B.Sc	Credits -3
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TITLE: POWER ELECTRONICS

Objectives:

- To study the characteristics of various power semiconductor devices.
- To understand the operation of power inverters.
- To study the operation of rectifiers with different loads.
- To understand the operation of different types of choppers.
- To understand the operation and controlling of motors.

Unit- 1

(12 Lectures)

Power Devices: Need for semiconductor power devices, Power diodes, Enhancement of reverse blocking capacity, Introduction to family of thyristors.

Silicon Controlled Rectifier (SCR): structure, I-V characteristics, Turn-On and Turn-Off characteristics, ratings, Factors affecting the characteristics ratings of SCR, Gate-triggering circuits, Control circuits design and Protection circuits, Snubber circuit.

Unit- 2

(14 Lectures)

Diac and Triac: Basic structure, working and V-I characteristic of, application of a Diac as a triggering device for a Triac.

Insulated Gate Bipolar Transistors (IGBT): Basic structure, I-V Characteristics, switching characteristics, device limitations and safe operating area (SOA) etc.

Application of SCR: SCR as a static switch, phase controlled rectification, single phase half wave, full wave and bridge rectifier switch inductive & non-inductive loads; AC voltage control using SCR and Triac as a switch.

Power MOS FETs: operation modes, switching characteristics, power BJT, second break down, saturation and quasi-saturation state.

Unit- 3

(10 Lectures)

Choppers: Basic chopper circuit, types of choppers (Type A-D), step-down chopper, step-up chopper, operation of d.c. chopper circuits using self commutation (A & B-type commutating circuit), cathode pulse turn-off chopper (using class D commutation), load sensitive cathode pulse turn-off chopper (Jones Chopper), Morgan's chopper

Unit-4

(10 Lectures)

Power Inverters: Need for commutating circuits and their various types, d.c. link inverters, Parallel capacitor commutated invertors with and without reactive feedback and its analysis, Series Inverter, limitation and its improved versions, bridge invertors.

Unit- 5

(14 Lectures)

Electromechanical Machines: DC Motors, Basic understanding of field and armature, Principle of operation, EMF equation, Back EMF, Factors controlling motor speed, Thyristor based speed control of DC motors, AC motor (Induction Motor only), Rotor and stator, torque & speed of induction motor, Thyristor control of ac motors (block diagrams only)

Outcomes:

Student should be able to

- Explain the characteristics of various power semiconductor devices and analyze the static and dynamic characteristics of SCR's.
- Design firing circuits for SCR.
- Explain the operation of rectifiers with different loads.
- Analyze the operation of different types choppers.

Suggested Books:

1. Power Electronics, K. Hari Babu, Scitech Publication.
2. Power Electronics, P.C.Sen, TMH
3. Power Electronics & Controls, S.K. Dutta
4. Power Electronics, M.D.Singh&K.B. Khanchandani, TMH
5. Power Electronics Circuits, Devices and Applications, 3rd Edition, .H.Rashid, Pearson Education

6. Power Electronics, Applications and Design, Ned Mohan,Tore.
7. Power Electronics, P.C.Sen, TMH.
8. Power Electronics, M.S.Jamil Asghar,PHI.
9. A Textbook of Electrical Technology-Vol-II,B.L.Thareja,A.K.Thareja, S.Chand

ELECTRONICS LAB-X**Power Electronics Lab****LAB LIST:**

1. Study of I-V characteristics of DIAC
2. Study of I-V characteristics of a TRIAC
3. Study of I-V characteristics of a SCR
4. SCR as a half wave and fullwave rectifier switch R and RL loads
5. DC motor control using SCR.
6. DC motor control using TRIAC.
7. AC voltage controller using TRIAC with UJT triggering.
8. Study of parallel and bridge inverter.
9. Design of snubber circuit
10. VI Characteristic of MOSFET and IGBT (Both)
11. Study of chopper circuits

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION
B.Sc. CBCS ELECTRONICS SYLLABUS

3rd YEAR

VI SEMESTER

Cluster-2

PAPER-B

PC MAINTAINANCE AND TROUBLE SHOOTING

ELECTRONICS		Year 2017- 18	B.Sc (MECs)	Credits - 3
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TITLE: PC MAINTENANCE AND TROUBLE SHOOTING

UNIT – I :12Hrs

INTRODUCTION TO COMPUTERS:

Block diagram & types of computers. Mother Board Characteristics, choosing a Motherboard, Installing a Mother board, Upgrading system BIOS. Bus Slots – ISA, MCA, EISA, PCI, USB and firmware (IEEE 1394). Features and comparison of 80286, 80386 and 80486, Characteristics of Pentium MMX, Comparison of Pentium-2 with all other processors. Dual core, core 2 duo, quad, P4, P4HT, I3, I5, I7 processors.

UNIT – II :12Hrs

BASIC TROUBLE SHOOTING: Introduction about proper tools in system maintenance, various test equipment for PC servicing, Reasons for failure of resistor, Reasons for failure of capacitor, Reasons for failure of other components, Safety precautions during trouble shooting.

Keyboard: Types of keyboards block diagram of keyboard, keyboard connectors. reasons for failure of keyboard.

Mouse: Working and components of mouse and different connectors.

Add on cards: MDA, CGA, VGA, Sound card, NIC card, SCSI Controller and FDC and HDC.

UNIT – III :12Hrs

STORAGE DEVICES: Introduction about disk drives, Characteristics of different disk drives

FDD:- Different types, working and components of drives.

HDD:-Different types, working and components of HDD drives partitioning & Formatting HDD

CDROM:- Different types working and components of CDROM drives.

DVD:- Different types, working and components of DVD.

Reasons for failure of disk drives

UNIT –IV :12Hrs

SMPS: linear, AT, ATX,

Block of SMPS and description of each block.

INTRODUCTION to UPS& SPS:

Reasons for power supply failure, Impact of power supply failure on PC

MONITOR: Introduction about display units, Different display technologies, block diagram, Reasons for display failure.

UNIT – V :12Hrs

PRINTERS:- Different types of printers, dot matrix, INKJET & LASER PRINTER – components and working.

PREVENTIVE MAINTANCE – Effect of heat and noise, Effect of corrosion on PC, Effect of power fluctuations, Effect of magnetic fields on system performance, EMI effect, Virus protection, Tools and techniques of S/W trouble shooting.

TEXT BOOKS:

1. UPGRADING AND REPAIRING PC – SCOTT MULLER.
2. IBM PC and Clones: Hardware, Troubleshooting and Maintenance - GOVINDARAJALU. B

REFERENCE BOOKS:

1. I.T. HARDWARE - NATSHELL.
2. PRINTER MANUALS.

ELECTRONICS LAB**PC MAINTENANCE AND TROUBLE SHOOTING LAB****LAB LIST:**

1. Identification of different peripherals and components in a PC.
2. Identification of different types of motherboards.
3. Identification of different expansion slots and add-on cards.
4. Assembling a PC
5. Study of CMOS ROM BIOS setup utilities.
6. . Change of CMOS password and boot sequence
7. Connecting hard drives, floppy drives and DVD writer
8. Creating partitions and formatting a hard drive.
9. Installation of windows 2000 Professional and windows XP
10. Installation of application software's and antivirus software
11. Installation of windows server 2003
12. Installation and configuring display sound and LAN cards.

ELECTRONICS LAB COMPUTER NETWORK LAB

- 1.Study of different types of network cables and practically implement the cross wired cable and straight through cable using clamping tool**
- 2.study of network Devices in detail.**
- 3.Study of network IP**
- 4.connect the computers in local area network**
- 5.study of basic network command and network configuration command**
- 6.configure a network topology using packet tracer software**
- 7.configure a network using link state vector routing protocol**

3rd YEAR

VI SEMESTER

Cluster-2

PAPER- IX (B2)

CONSUMER ELECTRONICS

ELECTRONIC S		Year 2017- 18	B.Sc (MECs)	Credits - 3
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TITLE: CONSUMER ELECTRONICS

Unit – I(12hrs)

1. MICROWAVE OVENS – Microwaves (Range used in Microwave ovens) – Microwave oven block diagram – LCD timer with alarm – Single-Chip Controllers – types of Microwave oven – Wiring and Safety instructions – care and Cleaning.

Unit – II(12hrs)

2. WASHING MACHINES – Electronic controller for washing machines – Washing machine hardware and software – Types of washing machines – Fuzzy logic washing machines Features of washing machines.

Unit – III(12hrs)

7. AIR CONDITIONERS AND REFRIGERATORS - Air Conditioning – Components of air conditioning systems – All water air conditioning systems – All air conditioning systems – Unitary and central air conditioning systems – Split air conditioners.

Unit – IV(12hrs)

HOME/OFFICE DIGITAL DEVICES – Fascimile machine – Xerographic copier – calculators – Structure of a calculator – Internal organization of a calculator – Servicing electronic calculators – Digital clocks – Block diagram of a digital clock.

Unit – V(12hrs)

DIGITAL ACCESS DEVICES – Digital computer – Internet access – online ticket reservation – functions and networks – barcode scanner and decoder – Electronic Fund Transfer – Automated Teller Machines(ATMs) – Set-Top boxes – Digital cable TV – Video on demand.

TEXTBOOKS:

1. S.P. Bali, Consumer Electronics – Pearson Education , New Delhi,2005.
2. R.G. Gupta Audio and Video systems Tata McGraw Hill(2004)

ELECTRONICS LAB CONSUMER ELECTRONICS LAB

(At least two Activities should be done)

1. Study of PA systems for various situations – Public gathering , closed theatre / Auditorium, Conference room, Prepare Bill of Material(Costing)
2. Installation of Audio/Video systems – site preparation , electrical requirements , cables and connectors
3. Market Survey of products (at least one from each module)
4. Identification of block and tracing the system. Assembly and Disassembly of system using Toolkit
5. Assembly and Disassembly of system and printer.

NOTE: one activity as directed in practical course is equivalent to 4 experiments.

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION

B. Sc ELECTRONICS SYLLABUS (2017-18)

3RD YEAR

VI SEMESTER

Cluster-2

PAPER- X (B3)

OPTICAL FIBER COMMUNICATION AND IT'S APPLICATION

Sub: ELECTRONICS		Year:2017-18	Group: B.Sc	Credits 3
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TITLE: OPTICAL FIBER COMMUNICATION AND IT'SAPPLICATIONS

OBJECTIVES:

- To study about the concept of fiber optic communication.
- To study light source and detectors
- To study the different types of fiber measurements.
- To study the concept of link design
- Introduction to fiber optic communication Receiver
- To study about fiber optic measurement
- To study about Optic Fiber Sensors and applications.

UNIT I: (10Hrs)

Fiber optic communication:

The basic communications systems, Nature of light, Advantages of fiber, Applications of fiber optic communications, Light wave fundamentals- Electromagnetic waves, Dispersion, Pulse distortion and information rate, polarization, Resonant cavities, Reflection at a plane boundary, Critical – angle Reflections ; Optic fiber waveguides: - Step-index fiber, Graded-index fiber, Attenuation. (Elementary Treatment only) .

UNIT II: (10Hrs)

Light source and detectors:

Light emitting diodes Operating characteristics, Laser diodes, Laser diode operating characteristics, Distributed feedback laser diode, Optical amplifiers, Light detectors: Principles of photo detection, Photo multiplier, Semi conductor photo diode, PIN photo diode, Avalanche photo diode.

UNIT III: (15Hrs)

MODULATION :

Light Emitting Diode Modulation and circuits, Laser diode modulation and circuits, Analog Modulation Format, Digital modulations formats. **SYSTEM LINK DESIGN:** Analog system design, Digital system design, power budget analysis.

UNIT IV: (15Hrs)

Optical Fiber Communication Receiver:

Introduction : Signal Path through Optical Data link, Receiver configuration with noise, Receiver noises, Noise at the input to the Amplifier, Receiver Capacitance and Bandwidth , Block diagram of Optical Receiver, Automatic Gain Control (AGC) circuit **Fiber Optical Measurement:** Introduction: Attenuation Measurement, Optical Time Domain Reflecto-meter (OTDR), Time Domain Dispersion Measurement, Frequency Domain Dispersion Measurements, Numerical Aperture Measurement using Scanning photo detector, measurement of losses in Splice and Connectors.

UNIT V: (10Hrs)

Fiber Optical Sensors and Applications:

Fiber Optic Sensor: Generalised Optical Fiber sensors, Phase and Polarization Fiber sensor, Optical Fluid Level Detector, Optical Fiber Flow Sensors, Optical Displacement sensors, Long haul communications , Local Area Networks.

TEXT BOOKS:

1. Fiber Optic Communications by Joseph C.Palais (4th Edition, Pearson Education)
2. Opto-electronics and Fiber Optic communications by C.K.Sarkar and D.C.Samkar
3. Fiber Optic Communications by S.Sankar. (New age international)

REFERENCE BOOKS:

1. Fiber Optic communication by senior-PHI
2. Fiber Optic communications Technology – Djafar k.Mynbaev, Lowell L. Scheiner.
3. Otical fiber communication-Gerd Kaiser
4. Optical communication system-John Gowar.

OUTCOMES:

- This course provides the students with the basic understanding of the concepts and principles of optical fibre communications.
- Line transmission systems,- analog and digital transmission system standards.
- On completion of the course, the students will be able to apply the knowledge and principles learnt to analyze, design, install and manage typical wired and wireless communication systems and networks

ELECTRONICS LAB-X
OPTICAL FIBER COMMUNICATION LAB

LAB LIST:

ABOUT FIBER OPTICS.

1: SETTING FIBER OPTIC ANALOG LINK

2: SETTING FIBER OPTIC DIGITAL LINK

3: STUDY OF LOSSES IN OPTICAL FIBER

4: BENDING LOSSES IN FIBER

5: STUDY OF NUMERICAL APERTURE OF OPTICAL FIBER

6: STUDY OF CHARACTERISTICS OF FIBER OPTIC LED.

7: STUDY OF TIME DIVISION MULTIPLEXING (DIGITAL)

Title: Optical fiber communication and it's applications

MODEL PAPER

SECTION-A

Answer any FIVE of the following:

5x5=25M

1. Explain about Nature of light.
2. Write about semiconductor photo diode.
3. Discuss about power budget analysis.
4. Explain about signal path trough data link
5. Write short note on fiber flow sensor.
6. Define the following terms(i)polarization (ii)Resonant cavities.
7. Explain about PIN photodiode
8. Write about Optical amplifiers..

SECTION-B

Answer any FIVE of the following:

5x10=50M

1. a) Explain briefly about the advantages and applications of OFC.
b) Discuss about Reflection at a plane of boundary.
2. a) Define Laser principles and explain it's operating characteristics.
b) Define the following terms (i)APD (ii)PMT.
3. a) Define modulation and explain about Analog formats..
b) Discuss briefly about digital system design.
4. a) Draw the block diagram of optical receiver and explain in detail.
b) Explain numerical aperture measurement using scanning photo detector
5. a) Discuss briefly about fiber optic sensors.
b) Explain about Long haul communication.