

COMMUNICATION ENGG.
(IC – 301-E)

L T T
3 1 4

Theory : 100 Marks
Sessional : 50 Marks
Time : 3 H

UNIT-1

Introduction: - Classification of signals, modulation techniques, sampling process, Nyquist roles, quantization, types of modulation, method of noise calculation in networks, mathematical representation of random noise, narrow band noise and its representation.

UNIT-2

Amplitude modulation: - Introduction to amplitude modulation, Maximum available modulation, AM demodulation, spectrum of AM double side band, suppressed carrier modulation, single side band modulation, methods of generating S.S.B signals and vestigial side band modulation.

UNIT-3

Frequency modulation system:- Angle modulation, phase and frequency modulation spectrum of FM signals, band width of FM signal, effect of modulation index on bandwidth, NBFM and WBFM, FM generation methods, FM demodulation, methods, parametric variation methods, Armstrong method.

UNIT-4

Digital Modulation: - Pulse amplitude modulation, TCM, PWM, PPM, Natural sampling, flat top sampling, quantization process PCM, Introduction of BPSK, DPSK, QPSK, ASK, FSK, PSK.

NOTE: The question paper shall have eight questions in all organized into four sections, each section having two questions from each of the four units. The candidate shall have to attempt five questions in all , selecting at least one question from each unit.

Reference: -

- | | | |
|----------------------|---|-------------------------------------|
| a) G. Kennedy | : | Electronics Communication system. |
| b) R. P. Singh | : | Communication system. |
| c) Simon Hykins | : | Communication system |
| d) Taub and shilling | : | Principles of communication system. |

**POWER SYSTEM
(IC-303-E)**

L T T
3 1 4

Theory : 100 Marks
Sessional : 50 Marks
Time : 3 H

UNIT-1

Generation of Power :

Thermal, hydro- electric, Nuclear and diesel Power plants choice of site working and layout. Fixed and running costs, load factor, max. Demand factor and diversity factor, tariffs, improvement of power factor.

UNIT-2

Transmission of power :

Short, Medium and long lines their representation and performance determination. Ferranti effect, skin effect Types of underground cables and their advantages and disadvantages.

UNIT-3

Protective Relays :

Functional characteristics of relays, operating principle of electromagnetic and static relays, over current, directional over current, differential and impedance relays, protection of generators and transformers, carrier current protection.

UNIT-4

Distribution of power:

A.C distribution system single and 3phase 4 wire system, D.C. distribution system: 2 wire, 3 wire and comparison of A.C. and D.C. components

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Books recommended :

1. Electrical power system by-C.L wadhwa.
2. Electrical Power system by-Soni Gupta, Bhatnagar, Dhanpat Rai.
3. Power System Analysis & design by- B.R. Gupta, Wheller.
4. Power System by J.B Gupta.

LINEAR CONTROL SYSTEM -II
(IC-305-E)

L	T	T	Theory	:	100 Marks
3	2	5	Sessional	:	50 Marks
			Time	:	3 H

UNIT-1**INTRODUCTION :**

Introduction to Modern control theory, Difference between classical & modern control system, Control Objective, Time specification and Frequency specification of control system using step response and ramp signal.

UNIT-2**COMPENSATION DESIGN :**

Types of Compensations, Feedback compensation, lead Compensation, Lag Compensation, lead –lag compensation, Design with series compensation lead lag compensation. Design using bode plots & root locus. Elimination and addition of zeros. Movement of poles and zeroes.

UNIT-3**STATE SPACE ANALYSIS :**

Concept of state, state variable, state vector, state model, vector matrix representation, derivation of state model from ordinary differential Equations, Characteristic Eqn, Eigen value State Transition matrix, properties of STM, Relation ship between state Eqn. and Transfer Function

UNIT-4**CONTROLLABILITY AND OBSERVABILITY**

Similarity Transformation, Decomposition of transfer function, controllability, Observability, Relation between controllability, observability and transfer function

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BOOKS RECOMMENDED:

1. Gopal M. , Control System principles and Design “Tata McGraw Hill”
2. R.S. Chauhan, Linear Control System, “Umesh Publication”
3. Kuo B.C., Automatic Control System “Prentice Hall India Ltd”
4. Ogata K. , Modern Control Engg. “Prentice Hall India Ltd”

**POWER ELECTRONICS
(IC-307-E)**

L T T
3 2 5

Theory : 100 Marks
Sessional : 50 Marks
Time : 3 H

UNIT-1

THYRISTORS :

Power electronic devices –DAIC, TRIAC, SCR, BJT, IGBT, GTO, different schemes of commutation of SCR. Terminal characteristics of Thyristor. Rating, protection, heating, cooling and mounting of Thyristor. Series- parallel operation of Thyristors. Firing circuits of Thyristors. SUS, SCS, PUT.

UNIT-2

PHASE CONTROLLED RECTIFIERS :

Principle of phase control, Full wave controlled converter, single phase full wave converter using R, R-L and R-L-E Load, Three phase converter system using diodes, Three phase Thyristor converter circuit R, R-L and R-L-E Load, dual converter. single Phase and three phase semi-converter, Effect of Source Induction single phase and three phase converter,

INVERTERS :

Series –Parallel Inverter, Single phase voltage source inverters, Three phase Bridge inverters, Modified Mc-Murray half bridge Inverter voltage control in single phase inverters, PWM inverters, Effect and reduction of Harmonics in inverter, Output voltage.

UNIT-3 CHOPPERS :

Principle of chopper operation, control strategies, types of chopper circuit, oscillating chopper Step up chopper, steady state analysis of class A chopper.

UNIT-4 CYCLOCONVERTERS:

Principle of cycloconverters, operation, single phase circuit, step up and step down cycloconverters only $1\phi, 3\phi, 3\phi$ to 1ϕ cycloconverters using three phase half wave and full wave converter in circulating and non circulating mode.

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BOOKS RECOMMENDED:

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|----|---|---------------------|
| 1. | Power Electronics By Dr. P.S. Bimbhra | Khanna Publishers |
| 2. | Power Electronics By Muhammad H. Rashid | Prentice Hall India |
| 3. | Power Electronics By P.C. Sen | Tata Mc Graw Hill |

MICROPROCESSORS
(IC-309-E)

L **T** **T**
3 **1** **4**

Theory : **100 Marks**
Sessional : **50 Marks**
Time : **3 H**

UNIT-1 8085 MICROPROCESSOR

General architecture of μ p, evaluation of microprocessor. Introduction of 8085 μ p, CPU architecture, system bus structure, interrupt structure, addressing modes, instruction format, instruction set, timing diagrams. Development of different programs.

UNIT-2 8086 MICROPROCESSOR

Introduction of 8086 μ p, CPU Architecture, Maximum & minimum mode, Timing diagrams, interrupt structure, addressing modes, instruction format, instruction set. Development of different programs.

UNIT-3 INTERFACING TECHNIQUES & DEVICES

Interfacing techniques: - Memory mapped I/O, I/O mapped I/O. Data transfer techniques, Block diagram & pin diagram of 8255, Interfacing of 8255 with μ p. Address determination of serial I/O port and parallel I/O ports. Address decoding techniques, Interfacing of USART 8251, DMA controller 8257, Interrupt controller 8259 with μ p.

UNIT-4 SEMICONDUCTOR MEMORY

General memory organization, Static RAM, Dynamic RAM, Different ROM devices, Interfacing of SRAM & DRAM with μ p, keyboard interfacing, A/D & D/A converters

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Books Recommended:

1. Microprocessor Architecture, Programming and Application by Ramesh S. Gaonkar.
2. Fundamentals of Microprocessors and Microcomputer by B.Ram
3. μ P Principles & Application by Gilmore (TMH)
4. μ P based design by Michael Slater
5. μ P interfacing and applications by Renu Singh, B.P. Singh.
6. The 8086 family, design, program and interfacing by John Uffenbeck

**TELEMETRY AND DATA RECORDING
(IC-311-E)**

L T T

3 1 4

Theory : **100 marks**
Sessional : **50 marks**
Time : **3 H**

UNIT-1

Telemetry : Types of Telemetry system, Characteristics of telemetry system, Electrical Telemetry, Transmission channels, DC and AC Telemetry systems, Current telemetering systems, voltage telemetering systems, Position telemetering systems, Frequency telemetering systems, Impulse telemetering system, Position telemetry system

UNIT-2

Multiplexing : Multiplexing in telemetering system, Time division multiplexing, Frequency Division Multiplexing, Wave division Multiplexing

UNIT-3

Digital Instruments : Introduction, Digital Instruments, Advantages of Digital instruments, Recorders, Recording requirements, Strip chart recorders, Types of Strip chart recorders Galvanometer type recorders, Null type recorders, Potentiometric Recorders

UNIT-4

Recorders : X-Y recorders, Ultraviolet recorders, Magnetic tape recorders, Advantages of magnetic tape recorders, Basic components of a tape recorder, Methods of recording, direct recording, Advantages and disadvantages of direct recording FM, PDM recording, Digital tape recorders.

NOTE : The question paper shall have eight questions in all organized into four sections, each section having two questions from each of the four units. The candidate shall have to attempt five questions in all, selecting at least one question from each unit.

REFERENCES :

1. Electrical & Electronics Measurement and Instrumentation by A.K.Sawhney
2. Electronic Instrumentation BY H.S. Kalsi
3. Electronic Measurement and Instrumentation by J.B. Gupta

INSTRUMENTATION AND CONTROL
Power Electronics Laboratory

B. Tech 5th Semester
Power Electronics Practical
(IC-313-E)

List of experiments

- 1 To study the Characteristics of SCR.
- 2 To study the Characteristics of TRIAC.
- 3 To study the Characteristics of UJT.
- 4 To vary the frequency of an Inverter Circuit.
- 5 To vary the speed of D.C. motor with the help of an SCR
- 6 To determine the ripple factor of a full wave rectifier using SCR for various firing angle.

Note : At least 9 experiments are to be performed with 6 from above list, the remaining may be performed & set by concerned institution as per the scope.

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INSTRUMENTATION AND CONTROL**Microprocessors Laboratory**

B. Tech 5th Semester Microprocessors Practical (IC-315-E)

List of experiments

- 1 Study of Microprocessor kit.
- 2 Write a program to subtract two numbers which are stored at memory location 2500 H and 2501 H using 2's complement method and store the result at 2200 H.
- 3 Write a program to add two numbers which are stored at memory location 2500 H and 2501 H. If the sum is greater than a byte display 01H otherwise display sum result should be stored at 2200H.
- 4 Write a program to eliminate zero value from a string and then store the resultant string in 10 data bytes which are stored in memory location starting at 2500H.
- 5 Write a program to arrange data bytes of a given string in ascending order this string is stored in memory location starting at 2500H. Data bytes: 5BH, 2AH, 01H, 2BH, 3EH, 15H, 11 H, 21 H, 45 H, 6DH.
- 6 Write a program to multiply two numbers which are stored in memory location 2200H and 2201. The result is stored in 2500 and 2501H.
- 7 Write a program to add two 16 bit numbers using instruction set of 8086 microprocessor.
- 8 Write a program to arrange given numbers in ascending order using 8086 microprocessor.
- 9 Write a program to multiply two 16 bit words in the memory Location 2200 H and 2201 H. the result is stored at certain memory locations.
- 10 Write a program average the temperatures names high temperature and to temp. And put the result in certain memory.

INSTRUMENTATION AND CONTROL

Control System Laboratory

**B. Tech 5th Semester
Control System Practical
(IC-317-E)**

List of experiments

- 1 To study the speed control of D.C. Motor.
- 2 To study the linear system simulator.
- 3 To study the stepper motor and its interface with Microprocessor.
- 4 To study the Compensation design.
- 5 To study the D.C. Position control system.
- 6 To study the Digital PID control system.
- 7 To study the PID and on –off control action on temperature control system.
- 8 To study of Relay control system.
- 9 To study of Potentials Metrics Error Detector.
- 10 To study of SC Position control system.
- 11 To study Synchros.
- 12 Other Experiments related to Theory if required.