

MICROPROCESSOR & APPLICATIONS
VI SEM. EEC-302-E

L	T	P	Total
4	1	-	5

Theory –100 Marks
Sessional-50 Marks
Duration: 3Hrs

UNIT I

Introduction to microprocessor, its advantage & limitations: Various type of processors including the special purpose; the concept of stored programme architecture; machine & instruction cycle timing; single chip vs. chip set microprocessor.

UNIT II

Microprocessor architecture & programming - Detailed description of 8085 pins, flags, registers etc.; generation of system clocks power on reset; addressing mode; instruction set; stack operation; sub routine & macros; interrupts; assembler directive languages programming

Buses: Parallel Vs serial; bus buffering tri stating noise; loading & reflection problem – an introduction only; bus standards like RS422/432, IEEE438, RS232.

UNIT III

Interfacing: Memory mapped I/O & input/output mapped I/O space, various data transfer techniques programme data transfer techniques, interrupt data transfer techniques, DMA.

Memory: Interfacing of the memory, various kinds of Memory (RAM, ROM, EPROM, EEPROM), IC 8755.

UNIT IV

Special purpose support devices & Application: Brief description & interfacing of 8255 PPI & 8253, 8251 USART & A/D ,D/A Chips , applications- A temperature monitoring system & closed loop control. Introduction to micro controller & advanced 8086 microprocessor & its architecture, comparison of 8086 & 8085.

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. R.S. GAONKAR: Microprocessor architecture, programming & Application.(MGH)
2. Malvino, A.P. : Digital computer electronics-an Introduction to microprocessor.(MGH)
3. D.V.HALL: Microprocessor & Digital circuits.(MGH)
4. MATHUR A.P. : Introduction to microprocessor

POWER SYSTEM ANALYSIS & PROTECTION
VI SEM. EEcT- 304-E

L	T	P/D	Total
3	1	-	4

Theory : 100 Marks
Sessional: 50 Marks
Duration : 3Hrs

UNIT I

Characteristics & representation of components of a power system, synchronous machines, transformers, lines cables & loads. Single line diagram.

Protective Relaying : Scheme of protection of generators, transformers, transmission lines & bus-bars, carrier current protection.

UNIT II

Circuit Interruption : Circuit interruption, theory of arc formation and it's excitation in d.c., a.c. circuits, restriking & recovery voltage, interruption of capacitive & inductive currents. Rupturing capacity & rating of circuit breakers.

Circuit-Breakers : Classification of circuit-breakers, circuit-breakers of low medium, high & extra high voltages. Multibreak & resistance switching. Autorestoreing of high capacity & H.V. circuit breakers.

UNIT III

Fault Analysis:- Symmetrical faults: calculation of fault currents, use of current limiting reactors.

Unsymmetrical faults: Types of transformation in power system analysis, symmetrical components transformation, sequence impedance of power system elements, Sequence network of power system analysis of unsymmetrical short faults sequence components filters, Network analysis & it's application to interconnected system.

UNIT IV

Transients in Power Systems: Transient electric phenomenon, lightning & switching surges, travelling waves, reflection & refraction of waves with different line termination, Protection against dangerous pressure rises.

Stability of power System: Concepts of stability, power angle characteristics of Synchronous, steady state & transient stability swing waves.

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. Elements of power system analysis by W.D. Stevenson.
2. Electric Power System by B.M. Weddy.
3. The transmission & Distribution of electric energy by H.Cotton.
4. Modern Power System Analysis by I.J. Nagrath & D.P. Kothari.
5. A course in Electrical Power by Soni, Gupta & Bhatnagar.
6. Power System Analysis & Stability by S.S. Vadhera
7. Electrical Power System by C.L. Wadhwa. 8. Electrical Power System by Ashfaq Hussain.
9. Electrical Power by S.L. Uppal.
10. Switching & Protection by Sunil S. Rao.

DESIGN OF ELECTRICAL MACHINES
VI SEM. EEcT-306-E

L	T	P/D	Total
3	1	-	4

Theory : 100 Marks
Sessional : 50 Marks
Duration : 3 Hrs.

UNIT I

DC MACHINES :Output equation, choice of specific loadings, choice of poles and speed, Design of conductors, windings, slots field poles, field coils, commutator and machine design.

UNIT II

SYNCHRONOUS MACHINES: Specifications, ratings and dimensions, specific loadings, main dimensions, low speed machines, turbo generators, armature conductors, cooling.

UNIT III

INDUCTION MOTORS: Three Phase Induction Motor: Standard specifications, output equations, specific loadings, main dimensions, conductor size and turns, no. of slots, slot design, stator core, rotor design, performance calculations.

Single Phase Induction Motor: output equations, specific loadings, main dimensions, design of main and auxiliary winding, capacitor design, equivalent circuit parameters, torque, efficiency,

UNIT IV

TRANSFORMERS: Standard specifications, output equations, design of core, coil, tank and Cooling tubes, calculation of circuit parameters, magnetizing current, losses and efficiency, Temperature rise and regulations from design data.

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.

TEXT BOOKS

1. M.G.Say, Performance and design of ac machines, CBS Publishers and distributors, New Delhi, 1983.
2. S.K. Sen., Principles of electrical machine design with computer programs, Oxford and IBH publishing co. 1987.

REFERENCES

1. J.H. Kuhlmann, Design of electrical operators, John Willey, 1957.
2. CG Veinott, Theory and design of small induction machines, MGH, 1959.
3. A Shanmugasundarem, Electrical machine design databook, John willey, 1979.

DIGITAL SIGNAL PROCESSING
VI SEM. EEET-308-E

L	T	P/D	Total
4	1	-	5

Theory : 100 Marks
Sessional: 50 Marks
Duration : 3Hrs

UNIT I

The Z – Transform Analysis of LTI System:- Transform its properties, System Function of a linear Time- Invariant system. Inversion of the Z-Transform, the one-sided Z-transform, Solution of difference equations. Analysis of LTI system in Z- domain, transient and steady- state response. Causality and stability. Pole- Zero Cancellations. Shur- Cohn Stability test. Jury Test Shur-Cohn-fuzzivera stability criterion.

UNIT II

DFT and FFT: DFT and its properties, Circular Convolution and fast linear convolution, Linear filtering using DFT. Direct Computation of DFT, FFT algorithms, Radix-2 and Radix-4 algorithms. Goetzel Algorithm, Chirp-Z Transform algorithm.

UNIT III

Implementation of Discrete-Time Systems: Structure for FIR Systems-direct form, Cascade form, Frequency-Sampling and Lattice structures, Structures for IIR-direct form, signal flow graphs and transpose structures. Cascades form and lattice structures, state space structure.

Design for Digital Filters:- Design for FIR filters-using window method (hamming window, rectangular window), using frequency of IIR filters from Analog filters by approximation of derivatives, by impulse invariance by Transformation, Matched Z-Transformation Characteristics of commonly used analog filters.

UNIT IV

Time Frequency Analysis: Introduction to wavelets and wavelet transforms.

Brief Introduction to DSP Architecture: Pipeline, Lattice and systolic architecture.

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. Digital Signal Processing by J.G. Proakis and D.G. Manalakis-PHI
2. Digital Signal Processing by: A.V. Oppenheim and R.W. Schafer-PHI
3. Element of Digital Signal Processing by N. Sarkar Khanna Publishers.
4. Digital Signal Processing by S. K. Mitra –TMH.
5. Digital Signal Processing by Rabinar, Gold-PHI
6. Digital Signal Processing by S. Salivahanan- TMH
7. Digital Signal Processing by IFecher

ELECTRIC DRIVES AND CONTROL
VI SEM. EEcT-310-E

L	T	P/D	Total
3	1	-	4

Theory : 100 Marks
Sessional : 50 Marks
Duration : 3Hrs

UNIT I

Introduction:- Definition & classification of different type of drives, Review of characteristics and components of electric drives, Speed control methods of various a.c. and d.c. drives, its advantages and applications, acceleration and retardation time, energy consideration.

Braking of drives:- Various methods of braking of a.c. and d.c drives, Automatic control arrangement, characteristics and application, acceleration and Retardation time ,Energy consideration.

Induction motor (A.C) drives:- Basic principle of induction motor drives, 3 ϕ a.c voltage controller fed I.M drive, variable frequency control, voltage source inverter (VSI) and current source inverter (CSI), cycloconverter fed IM drive, Slip Power control, static rotor resistance control, chopper control of 3 - ϕ slip ring induction motor.

UNIT II

D.C. drives:- Rectifier controlled circuits, Single phase fully controlled and half controlled rectifier fed separately excited d.c motor, 3 ϕ fully and half controlled fed separately excited d.c. Motor, performance and characteristics of single phase and 3 ϕ rectifier controlled d.c drives. Control techniques of d.c. Drives using chopper, multi quadrant control of chopper fed motors.

UNIT III

Dynamics of Electric drives:- Fundamental load torque equation, permissible frequency of starting and stopping, definite time, speed and current limit control, Automatic starting and pulling operation of synchronous motors.

Digitally Controlled (Microprocessor control of Electric drives) :- Application areas and functions of HP in drive technology, Block diagram of arrangement and comparison with other method, components for digital control, vector control of IM drive using HP.

UNIT IV

Traction Drives:- Nature of traction load, motors, conventional d.c & a.c traction drives, characteristics, d.c traction using chopper controlled d.c motors, polyphase a.c motors for traction drives, speed time relationship.

Rating of motors:- Determination of motor rating, Nature of loads and classes of motor duty, frequency of operation of motor subjected to intermittent loads, pulse loads etc.

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. Electric drives by S.K.Pillai, Wiley.
2. Thyristor D.C Drives by S.K.Sen.
3. Control System in Industry by Siskind, McGraw Hill. 4. Electric Machines & Drives by Fransver. Relevant I.S.I. Cader.

ELECTRICAL MATERIALS AND PROCESSES
EEcT-312-E

L	T	P/D	TOTAL
3	1	-	4

Theory	:	100 Marks
Sessional	:	50 Marks
Duration	:	3 Hrs

UNIT 1

Conductors, Properties of conductors, ACSR, High resistivity materials and their properties, Alloys, Soldering and brazing materials, superconductivity, super conductor materials and their applications.

UNIT 2

Insulators, classification of insulators, dielectric materials, glass and ceramics, refractory materials and their uses, optical fibers, lasers and opto-electronics materials, semiconductor materials, properties of semiconductor materials thermosetting and thermoplast materials.

UNIT 3

Classification of material, dia, para, and ferro magnetic materials-curie law and curie weiss law (qualitative study). Ferromagnetism-Qualitative study of domain theory-Hysteresis phenomena. Hard and soft magnetic material and their applications. Ferrites, Structure and property.

UNIT 4

Processes used in Plano technology e.g. lapping, polishing, cleaning, masking, photolithography, diffusion, oxidation and Metallization, welding wire bonding, packaging and encapsulation, Heating-induction and dielectric, Electron beam welding and cutting, annealing, cold & Hot rolling

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REFERENCE :

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| 1. Kasap S.O. | Principles of Electrical Engg. Material and Devices(MGH) |
| 2. Mahajan | Principles of growth and processing of semiconductors(MGH) |
| 3 Dhir. | Electronics components and materials and principles
Manufacturing & Maintenance (TMH) |
| 4. Addison: | Electronics Engg. Material Devices (TMH) |
| 5. Ruska N scot: | Microelectronics processing an introduction to the manufacturer
of integrated Circuits(MGH) |
| 6. Seth & Gupta: | A course in electrical Engg. Materials(Dhanpat Rai & Sons) |
| 7. Dekker: | Electrical Engg. Materials(PHI) |