

BASICS OF INDUSTRIAL SOCIOLOGY, ECONOMICS AND MANAGEMENT

HUM-201-E

L T P
3 1 -

Sessional: 50 Marks
Theory : 100 Marks
Total : 150 Marks
Duration : 3 Hrs.

Unit-I

Meaning of social change, nature of social change, theories of social change. The direction of social change, the causes of social change. Factors of social change – the technological factors, the cultural factors, effects of technology on major social institutions, social need of status system, social relations in industry.

Unit –II

Meaning of industrial economic, production function, its types, least cost combination, law of variable proportion, laws of return- increasing, constant & diminishing.

Fixed & variable costs in short run & long run, opportunity costs, relation between AC & MC, U-shaped short run AC Curve.

Price & output determination under monopoly in short run & long run. Price discrimination, Price determination under discriminating monopoly. Comparison between monopoly & perfect competition.

Unit-III

Meaning of management, characteristics of management, management Vs administration, management – Art, Science & profession, Fayol's principles of management.

Personnel management – meaning & functions, manpower – process of manpower planning, recruitment & selection – selection procedure.

Training – objectives & types of training, various methods of training. Labour legislation in India – main provisions of industrial disputes Act 1947.

Unit-IV

Marketing management – definition & meaning, scope of marketing management, marketing research – meaning, objectives.

Purchasing management – meaning & objectives, purchase procedure, inventory control techniques.

Financial management – introduction, objectives of financial decisions, sources of finance.

Note:- Eight questions are to be set taking two from each unit. The students are required to attempt five questions in all, taking at least one from each unit.

Text Books:-

1. “Modern Economic Theory” Dewett, K.K.S. Chand & Co.

POWER GENERATION AND CONTROL (EE-202-E)

L T P
3 1 -

Sessional: 50 Marks
Theory : 100 Marks
Total : 150 Marks
Duration : 3 Hrs.

Unit – I

Load and loading forecasting:

Load curves, maximum demand, load factor, diversity factor, capacity factor, utilization factor, types of load, load forecasting.

Power plant economics

Choice of type of generation, size of generator and number of units, cost of electrical energy, depreciation of plant, effect of load factor on cost of Electrical Energy.

Tariffs and power factor improvement

Different types of tariffs and methods of power factor improvement.

Unit-II

Thermal power plants

Choice of site, main and auxiliary equipment fuel gas flow diagram, water stream flow diagram, working of power plants and their layout, characteristics of turbo generators.

Hydro electric plants

Choice of site, classification of hydro electric plants, main parts and working of plants and their layouts, characteristics of hydro electric generators.

Unit-III

Nuclear power plants

Choice of site, classification of plants, main parts, layout and their working, associated problems.

Diesel power plants

Diesel plant equipment, diesel plant layout and their working, application of diesel plants.

Combined working of plants

Advantages of combined operation plant requirements of base load and peak load operation. Combined working of run off river plant and steam plant.

Unit-IV

Power station equipment and control

- i) Excitation system- Purpose and requirements of excitation system, brushless excitation system.
- ii) Voltage regulators – Function and characteristics of automatic voltage regulators, solid regulator.
- iii) Speed Governing – Purpose of speed governing system, Hydraulic type, speed governing system for steam turbines and steam turbines and hydro turbines.
- iv) Automatic generation control - types of interconnection, advantages of interconnection, real and reactive power control, single area automatic generation control, automatic generation control for two area system, types of automatic generation control for interconnection power systems.

Text Books:

1. C.L. Wadhwa, “Electric Power System” (Wiley Eastern Ltd).
2. I.J. Nagnath and D.P. Kothar “Power System Engineering” TMGH

Note:- eight questions are to be set in total covering entire course selecting two questions from each unit. Each question will be of equal marks. Students will be required to attempt five questions in all, selecting at least one question from each unit.

DIGITAL ELECTRONICS (EE-204-E)

L T P
3 1 -

Sessional: 50 Marks
Theory : 100 Marks
Total : 150 Marks
Duration : 3 Hrs.

Unit-I

Fundamentals of Digital Techniques:

Digital signal, logic gates, AND, OR, NOT, NAND, NOR, EX-OR, Boolean algebra, review of number systems, binary codes, BCD, Excess-3, Gray, EBCDIC, ASCII, Error detection and correction codes.

Unit-II

Combination Design using Gates:

Design using gates, Karnaugh map and quine mclukay methods of simplification.

Combinational design using MSI Devices

Multiplexers and Demultiplexers and their use as logic elements, Decoders, Adders/Subtractors, BCD arithmetic circuits, Encoders, Decoders/Drivers for display devices.

Unit-III

Sequential circuits:

Flip flops: S-R, J-K, T,D, master slave, edge triggered, shift registers, sequence generators, counters, asynchronous and synchronous ring counters and Johnson Counter, Design of synchronous and Asynchronous sequential circuits.

A/D AND D/A Converters:

Sample and hold circuits, weighted resistor and R-2 R ladder D/A converters, specifications for D/A converters, A/D converters: Quantization, Parallel-comparator, successive approximation, counting type, dual slope ADC, specifications of ADCs.

Unit-IV

Digital logic families:

Switching mode operation of p-n junction, bipolar and MOS, devices, Bipolar logic families: RTL, DTL, DCTL, HTL, TTL, ECL, MOS, and CMOS logic families. Tristate logic, interfacing of CMOS and TTL families.

Programmable logic devices:

ROM, PLA, PAL, FPGA and CPLDS.

Text Books:

1. Modern Digital Electronics (Edition III) : R.P. Jain, TMH.
2. Digital Integrated Electronics: Taub & Schilling, MGH
3. Digital Principles and Applications: Malvino & Leach, MGH

Note: Eight questions are to be set in total covering entire course selecting two questions from each unit. Each question will be of equal marks. Students will be required to attempt five questions in all, selecting at least one question from each unit.

COMMUNICATION SYSTEM (EE-206-E)

L T P
3 1 -

Sessional: 50 Marks
Theory : 100 Marks
Total : 150 Marks
Duration : 3 Hrs.

Unit-I

Introduction to communication systems:

The essentials of a communication system, modes and media's of communication, classification of signals and systems, Fourier Analysis of signals.

Unit-II

Amplitude modulation:

Amplitude modulation, generation of AM waves, Demodulation of AM waves, DSBSC, Generation of DSBSC waves, single side band modulation, generation of SSB waves, demodulation of SSB waves, vestigial sideband modulation (VSB).

Angle modulation:

Basic definition, phase modulation (PM) & frequency modulation (FM) multiplexing, pulse amplitude modulation (PAM), pulse time modulation.

Unit-III

Pulse analog modulation:

Sampling theory, time division (TDM) and frequency division (FDM) multiplexing, pulse amplitude modulation (PAM), pulse time modulation.

Pulse digital modulation:

Elements of pulse code modulation, noise in PCM systems, measure of information, channel capacity, channel capacity of a PCM system, differential pulse code modulation (DPCM). Delta modulation (DM).

Unit-IV

Digital modulation techniques:

ASK, FSK, BPSK, QPSK, M-ary PSK.

Introduction to noise:

External noise, Internal noise, S/N ratio, noise figure.

Text Books:

1. Communication systems (4th edn.): Simon Haryins, John Willey & sons.
2. Communication systems: Singh & sapre, TMH.

References books:

1. Electronic Communication Systems: Kennedy, TMH.
2. Communication Electronics: Frenzel, TMH.
3. Communication Systems: Taub & Schilling, TMH
4. Communication Systems: Bruce Carison.

Note: Eight questions are to be set in total covering entire course selecting two questions from each unit. Each question will be of equal marks. Students will be required to attempt five questions in all, selecting at least one question from each unit.

SIGNAL & SYSTEMS (EE-208-E)

L T P
3 1 -

Sessional: 50 Marks
Theory : 100 Marks
Total : 150 Marks
Duration : 3 Hrs.

SIGNAL Unit-I

Types of Signals:-

Deterministic and Stochastic, periodic and a periodic, impulse functional sequences, analog and discrete, singular functions. Signal representation in terms of singular functions, orthogonal functions and their use in signal representation. Fourier series, Fourier and La-place transforms. Convolution theorem, geometrical interpretation and application.

Unit-II

Probability concepts, random variable, pdf, cdf, moments, distributions, correlation functions. Characterization of stochastic signals.

Discretisation of analog signals – sampling, sampling theorem and its proof. Effect of under sampling, recovery of analog signals from sampled signal. Characterization of Discrete signals- in terms of impuse sequences, Z-transforms. Properties, inversion and applications of La-place, Fourier and Z-transforms.

SYSTEM Unit-III

Classification linear and non-linear, time invariant and time varying, Lumped and distributed. Deterministic and Stochastic. Casual and non casual. Analog and Discrete/Digital memory and memory less, 1 port and N – port, SISO, SIMO, MISO, MIMO.

Unit-IV

System modeling in terms of differential, equations, state variables, difference equations and transfer functions.

Linear time invariant system properties, elementary idea of response determination to deterministic and stochastic signals. Concept of impulse response.

Text Books:

1. Fred J. Taylor – “Principles of signals and system”, MGH.
2. Simon Haykins – “Signal & Systems”, Willey Eastern.
3. A Papoulis – “Circuit and System” Modern Approach HRW.

Note: Eight questions are to be set in total covering entire course selecting two questions from each unit. Each question will be of equal marks. Students will be required to attempt five questions in all, selecting at least one question from each unit.

ELECTRICAL MACHINES-II (EE-210-E)

L T P
3 2 -

Sessional: 50 Marks
Theory : 100 Marks
Total : 150 Marks
Duration: 3 Hrs.

Unit-I

Basic Concept of Electrical Machines:

Basic concept of electrical machines: winding factors, generated e.m.f. and m.m.f distributed a.c. winding, rotating magnetic field.

Unit-II

Induction machines:-

- a) Construction features, production of torque, phasor diagram, equivalent circuit, performance analysis, torque slip characteristics.
- b) Testing running light and blocked rotor test, load test.
- c) Effect of rotor resistance, deep bar and double cage induction motor.
- d) Generator operation.
- e) Starting – Starting method of squirrel cage and wound rotor induction motor.
- f) Effect of space harmonics.

Unit-III

Signal phase induction motors:-

- a) Constructional features, double revolving field theory, equivalent circuit, determination of parameters.
- b) Split phase starting methods & application.

Unit-IV

Synchronous machines:-

- a) Constructional features.
- b) Cylindrical rotor machines.
 - i) Synchronous generator – Generated emf, circuit model and phasor diagram, armature reaction, synchronous impedance, voltage regulation and different methods for its estimation.
 - ii) Synchronous motor – Operating principle, circuit model, phasor diagram, effect of load.
 - iii) Operating characteristics of synchronous machines V-curves starting methods of synchronous motors.
- c) **Salient pole machine:-** Two reaction theory, analysis of phasor diagram, power angle characteristics, determination of x_d and x_q .
- d) **Parallel operation of alternators:-** Synchronous and load division.

Text Books:

1. P.S. Bhimbra “Electric Machinery” Khanna Publishers.
2. Nagrath & Kothari “Electric Machines” TMH
3. Fitzgerald & Kingsley “Electric Machinery” MGH.

Note: Eight questions are to be set in total covering entire course selecting two questions from each unit. Each question will be of equal marks. Students will be required to attempt five questions in all, selecting at least one question from each unit.

POWER SYSTEM-I (EE-212)

L T P
0 0 2

Sessional: 25 Marks
Exam : 25 Marks
Total : 50 Marks
Duration : 3 Hrs.

1. a) To measure the dielectric strength of transformer oil.
 b) To find string efficiency of string insulator.
 - i) Without guard ring.
 - ii) With guard ring.
2. To measure ABCD parameters of transmission line.
3. To plot power angle characteristics of transmission line.
4. Parallel operation of two alternators.
5. To create unbalanced voltage system and to measure the sequence voltage by segregating network.
6. To study the characteristics of transmission line represented by
 - i) T- network
 - ii) Pie – network.
7. To study the characteristics of differential relay.
8. Testing and calibration of energy meter.
9. To plot the characteristics of an IDMT static relay.
10. Testing of current transformer.

Note: Eight questions are to be set in total covering entire course selecting two questions from each unit. Each question will be of equal marks. Students will be required to attempt five questions in all, selecting at least one question from each unit.

ELECTRICAL MACHINE-II LAB (EE-214-E)

L T P
0 0 3

Sessional: 25 Marks
Exam : 25 Marks
Total : 50 Marks
Duration : 3 Hrs.

1. Determine mechanical losses by light running of a 3-phase induction motor.
2. To perform load test on a 3-phase induction motor & DC generator set and to determine the efficiency of induction motor.
3. Study and starting of 1-phase induction motor. To perform light running and block rotor test and to determine the parameters of the equivalent circuit.
4. To perform the open circuit test and block rotor test on 3-phase induction motor and draw the circle diagram.
5. To find out the rotor resistance of a poly phase induction motor.
6. To calculate regulation by synchronous impedance method:-
 - i) Conduct open and short circuit test on a three phase alternator.
 - ii) Determine and plot variation of synchronous impedance with I_f
 - iii) Determine SCR
 - iv) Determine regulations for 0.8 lagging power factor, 0.8 leading power factor and unity power factor.
7. To plot V curves of a synchronous machine.
8.
 - a) Determination of X_o of a synchronous machine.
 - b) Measurement $X_d + X_q$ (Direct axis and Quardiant axis)
9. To measure X_q of synchronous machine (negative sequence reactance).
10. To calculate regulation by ZPF method.
11. To study the parallel operation of synchronous generator.

Note: At least ten experiments are to be performed; at least seven experiments should be performed from above list. Remaining three experiments may either perform from the above list or designed and set by the concerned institution as per the scope of the syllabus.

DIGITAL ELECTRONICS LAB (EE-214-E)

L T P
0 0 3

Sessional: 25 Marks
Exam : 25 Marks
Total : 50 Marks
Duration : 3 Hrs.

1. Study of TTL gates- AND, OR, NOR, NAND, NOT, EX-OR, EX-NOR.
2. Design & realize a given function using K-Map and verify its performance.
3. To verify the operation of multiplexer & Demultiplexer.
4. To verify the operation of comparator.
5. To verify the truth tables of S-R, J-K, T& D type flip flops
6. To verify the operation of bi-directional shift register.
7. To design & verify the operation of 3-bit synchronous counter.
8. To design and verify the operation of synchronous UP/DOWN decade counter using JK flip flop & drive a seven segment display using the same.
9. To design and verify the operation of asynchronous UP/DOWN decade counter using JK flip flop & drive a seven segment display using the same.
10. To design and realize sequence generator for a given sequence using JK Flip flop.
11. Study of CMOS NAND & NOR gates and interfacing between TTL and CMOS gates.
12. Design a 4-bit shift register and verify its operation of a ring counter and a Johnson counter.

Note: *At least ten experiments are to be performed; at least seven experiments should be performed from above list. Remaining three experiments may either perform from the above list or designed and set by the concerned institution as per the scope of the syllabus.*

DIGITAL ELECTRONICS LAB (EE-214-E)

L T P
0 0 3

Sessional: 25 Marks
Exam : 25 Marks
Total : 50 Marks
Duration : 3 Hrs.

1. To study of time properties of Signal.
2. To verify basis properties of linear system (Superposition Theorem etc).
3. To demonstrate how sampling rules affect the output.
4. To study sampling theorem for low pass signals and band pass signals.
5. To study the LPF & HPF using RC Ckt.
6. To study band pass and band reject filters using RC Ckt.
7. To study response of Pulse Amplitude Modulation & Demodulation process.
8. To study response of Pulse Width Modulation & Demodulation process.
9. To study response of Pulse Position Modulation & Demodulation process
10. To study response of Pulse Code Modulation & Demodulation process.
11. To study the special response on spectrum analyzer? Having unit impulse I/P & sine Input (for various ckt.).
12. To study signal synthesis via sum of various harmonic.

Note: *At least ten experiments are to be performed; at least seven experiments should be performed from above list. Remaining three experiments may either perform from the above list or designed and set by the concerned institution as per the scope of the syllabus.*