

Basics of economics & management

L T P
3 1 0

Sessional: 50 marks
Theory: 100 marks
Total: 150 marks

UNIT – 1

Meaning of Industrial Economics, reduction function, its types, least cost combination, law of variable production, law of returns; 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 completion

UNIT – II

Meaning of management, characteristics of management, management VS administration management - Art, Science & Protection, Fayol's principles of management, Human relation approach, functions of management.

UNIT – III

planning & organizing

Planning, steps in planning, planning premises, difference between planning policy & strategy, Authority & responsibility, centralization & decentralization.

UNIT – IV

Staffing , directing & Controlling – Manpower Planning, Recruitment & selection styles of leadership, communication process and barriers, control process and steps in controlling.

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 Economics Theory" Dewett, K.K., S.chand & Co.
2. "Economics Analysis" K.P. Sudharam & E.N. Sudharam (Sultan Chand & Co.)
3. "Micro Economics Theory" M.L. Jhingan(Konark Pub., Pvt, Ltd.)
4. "Principles and practice of management" L.M. Parshad.
5. "Essentials of management" Haroda Kaontz.
6. "Organization and management " R.D. Aggarwal, Tata McGraw Hill.

Reference Books:

1. "Oraganization and management: R.D. Aggarwl, Tata McGraw Hills.
2. Business Organization and Management : M.C. Gupta

MATH – 201-E MATHEMATICS – III

L **T** **P**
3 **1** **0**

Sessional: **50 marks**
Theory: **100 marks**
Total: **150 marks**

UNIT – 1

Fourier series: Euler's Formulae, Conditions for Fourier expressions, Fourier expansion of functions having points of discontinuity, change of interval, Odd & even functions, Half –range series.

Fourier Transforms: Fourier integrals, Fourier transforms, Fourier cosine and sine transforms. Properties of Fourier transforms, Convolution theorem, Parseval's identity, Relation between Fourier and Laplace transforms, Fourier transforms for the derivatives of a function, Applications to boundary value problems.

UNIT – II

Functions of Complex Variables: Functions of a complex variable, Exponential function, Trigonometric, Hyperbolic and Logarithmic functions, limit and continuity of a function, Differentiability and analyticity.

Cauchy- Riemann equations, necessary and sufficient conditions for a function to be analytic, Polar form of the Cauchy- Riemann equations, Harmonic functions, Applications to flow problems, Conformal transformation, Standard transformations (translations, Magnifications & rotation , inversion & reflection, Bilinear).

UNIT – III

Probability Distributions: Probability, Baye's theorem, Discrete & continuous probability distributions, Moment generating function, Probability generating function, properties and applications of Binomial, Poisson and normal distributions.

UNIT – IV

Linear Programming: Linear programming problems formulation, Solution of Linear Programming Problem using Graphical methods, Simplex Method, Dual-Simplex Method.

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. Higher Engg. Mathematics: B.S. Grewal
2. Advanced Engg. Mathematics: E.Kreyszig.

Reference Books:

1. Complex variables and Applications: R.V. Churchill; McGraw Hill.
2. Engg. Mathematics Vol. II: S.S. Sastry; Prentice Hall of India.
3. Operation Research : H.A. Taha.
4. Probability and statistics for Engineer: Johnson, PHI.

Transmission and Distribution

L **T** **P**
3 **1** **0**

Sessional: **50 marks**
Theory: **100 marks**
Total: **150 marks**

UNIT – 1

GENERAL

Importance of electric power, power system components, Growth of Power systems in India, power supply network, effect of voltage in conductor size, comparison of conductor vol. in typical systems elementary high voltage DC transmission and its advantages and disadvantages.

UNIT – II

LINE PARAMETERS:-

Evaluation of inductance, capacitance, resistance for single phase, three phase symmetrical, transposed, untransposed single circuit, double circuit lines, skin and proximity effect.

PERFORMANCE OF LINES:-

Classification of line as short, medium and long, representation and detailed performance analysis of these lines including ABCD parameters, detailed measurements and universal power circle diagram.

UNIT – III

MECHANICAL CONSIDERATIONS:-

Various types of line conductors, line supports, poles and towers, sag calculations, effect of wind, ice, and temperature, stringing chart, sag template, line vibration.

Insulators:- Various types of insulators, voltage distribution, string efficiency, methods of increasing string efficiency.

CORONA:-

Phenomenon of CORONA, disruptive critical voltage, corona loss, radio interference.

UNIT – IV

UNDER GROUND CABLES:-

Classifications and construction, insulation resistance, capacitance, capacitance determination, power factor in cables, capacitance grading, use of inter sheaths, losses, heat dissipation and temperature rise in cables, current rating, comparison with overhead lines.

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.

Reference Books:

1. CI Wadhwa, "Electric Power Systems" (Willey Eastern Ltd)
2. IJ Nagrath and DP Kothari "Power System Engineering" Taha MGH.

EE-203-E NETWORK ANALYSIS & SYNTHESIS

L	T	P
3	1	0

Sessional:	50 marks
Theory:	100 marks
Total:	150 marks

UNIT – 1

TOPOLOGY:

Principles of network topology, graph matrices, network analysis using graph theory.

TRANSIENT RESPONSE:

Transient Response of RC, RL, RLC Circuits to various excitation signals such as step, ramp, impulse and sinusoidal excitations using Laplace transform.

UNIT – II

NETWORK FUNCTIONS:

Terminal pairs or Ports, Network functions for one-port networks, poles and zeros of Network functions, Restrictions on pole and zero locations for driving point functioning and transfer functions, time domain behavior from the pole-zero plot.

UNIT – III

CHARACTERISTICS AND PARAMETERS OF TWO PORT NETWORK:-

Relationship of two-port variables, short-circuit Admittance parameters, open circuit impedance parameters, transmission parameters, hybrid parameters, relationships between parameters sets, inter-connection of two port networks.

UNIT – IV

TYPES OF FILTERS AND THEIR CHARACTERISTICS:

Filter fundamentals, high-pass, low-pass, and band-pass, and band-reject filters.

NETWORK SYNTHESIS:

Positive real functions. Synthesis of one port and two port networks, elementary ideas of Active networks.

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.

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Text Books:

1. Network Analysis & Synthesis: Umesh Sinha; Satya Prakash Pub.
2. Network Analysis & Synthesis: F.F. Kuo Wiley & Sons Inc.

Reference Books:

1. Introduction to modern Network Synthesis: Van Valkenburg; John Wiley.
2. Network Analysis: Van Valkeburg; PHI.
3. Basic circuit theory: Dasoer Kuh; McGraw Hill.
4. A Course in Electrical Circuit Analysis by Soni & Gupta; Dhanpat Rai Pub.
5. Circuit Analysis: G.K. Mithal; Khanna Pub.
6. Networks and Systems: D. Roy Choudhury; New Age International.

EE-205-E ANALOG ELECTRONICS

L	T	P	Sessional:	50 marks
3	1	0	Theory:	100 marks
			Total:	150 marks

UNIT – 1**SEMICONDUCTOR DIODE:**

P-N Junction and its V-I Characteristics, P-N junction as rectifier, switching characteristics of Diode.

DIODE CIRCUITS:

Diode as a circuit element, the load-line concept, half-wave and full rectifiers, clipping circuits, clamping circuits, filter circuits, peak to peak detector and voltage multiplier circuits.

UNIT – II**TRANSISTOR AT LOW FREQUENCIES:**

Bipolar junction transistor: operation, characteristics, Ebers-moll model of transistor, hybrid model, h- parameters (CE, CB, CC configurations), analysis of a transistor amplifier circuits using h-parameters, emitter follower, miller's Theorem, frequency response of R-C coupled amplifier.

TRANSISTOR BIASING:

Operating point, bias stability, collector to base, self-bias, bias compensation, thermistor & sensor compensation.

UNIT – III**TRANSISTOR AT HIGH FREQUENCIES:**

Hybrid P model, CE short circuit current gain, frequency response, alpha, cutoff, gain bandwidth product, emitter follower at high frequencies.

FIELD EFFECT TRANSISTORS:

Junction field effect transistor, pinch off voltage, volt-ampere characteristics, small signal model, MOSFET Enhancement & Depletion mode V-MOSFET, common source amplifier, source follower, biasing of FET, Applications of FET as a voltage variable resistor (VVR)

UNIT – IV

OPERATIONAL AMPLIFIER:

OP-AMP, differential amplifier and its DC, AC analysis, OP-AMP characteristics, Non-Inverting/Inverting Voltage and current feedback linear and Non-linear, OP-AMP circuit.

REGULATED POWER SUPPLIES:

Series and shunt voltage regulations, power supply parameters, three terminal IC regulators, SMPS

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. Integrated Electronics; Miliman & Halkias; McGraw Hill
2. Electronic circuit analysis and design (Second edition) D.A.V neamen: TMH

Reference Books:

1. Electronics principles: Malvino : McGraw Hill.
2. Electronics Circuits: Donald L. Schilling & Charles Belove, McGraw Hill.
3. Electronics Devices & Circuits: Boylested & Nashelsky : Pearson.

EE – 207 – E ELECTRICAL MACHINE – I

L **T** **P**
3 **1** **0**

Sessional: 50 marks
Theory: 100 marks
Total: 150 marks

UNIT – 1

TRANSFORMERS: Principle, construction of core, winding & tank, operation, testing of single phase transformer, equivalent circuit, phasor diagram parameters determination, P.U representation of parameters, regulation, losses & efficiency, separation of iron losses.

UNIT – II

Various types of connection of three phase transformer, their comparative features, Zigzag connection.

Parallel operation of single phase & three phase transformers. Auto-Transformer: Principle, construction, comparison with two winding transformers, applications.

UNIT – III

Nature of magnetizing current, plotting of magnetizing current from B-H curve, inrush current, harmonics, effect of construction on input current, connection of three phase transformer. Phase-Conversion: Three to two phase, three to six phase and three to twelve phase conversions. Introduction to three winding, tap-changing & phase- shifting transformers.

UNIT – IV

D.C. MACHINES: Elementary DC machine, principle & construction of D.C. generator, simplex lap wave winding E.M.F. equation, armature reaction compensating winding, commutation, methods of excitation, load characteristics, parallel operation. Principle of DC

motors, torque and output power equations, load characteristics, starting, speed control, braking, testing, efficiency & applications.

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. Electrical machines: I.J. Nagrath and D.P. Kothari, TMH, New Dehli.
2. Performance & Design of DC Machines: A.E Clayton & N.N Hancock; ELBS.

Reference Books:

1. Electric machinery, Fitzgerald & Kingsley, MGH.
2. Theory of alternating current machinery, A.S Langsdorf, TMH.
3. Electrical Machines, P.S. Bhimbra, Khanna Pub. Delhi.

EE-209-E ELECTRICAL MEASUREMENTS & MEASURING INSTRUMENTS

L	T	P
3	1	0

Sessional:	50 marks
Theory:	100 marks
Total:	150 marks

UNIT – 1

UNITS STANDARD & ERRORS: S.I. units, Absolute standards (International, Primary, secondary & Working Standards). True Value, Errors (Gross Systematic Random): Static characteristics of Instruments (Accuracy, precision, Sensitivity, Resolution & threshold).

MEASURING SYSTEM FUNDAMENTALS: Classification of instruments (Absolute & Secondary Instruments: indicating, recording & Integrating instruments: Based upon Principle of operation). Generalized instrument (Block diagram, description of blocks). Three forces in electromechanical indicating instrument (Deflecting, controlling & damping forces). Comparison between gravity & spring controls: comparison of damping methods & their suitability bearing supports, pivot-less supports (simple & taut-band). Scale information, instrument cases (covers).

UNIT – II

MEASURING INSTRUMENTS: Construction, operating principle, Torque equation, Shape of scale, use as Ammeter or as Voltmeter (Extension of Ranger). Use on AC/DC or both. Advantages & disadvantages, errors (both on AC/ DC) of PMMC types, Electrodynamic Type, moving iron type (attraction, repulsion & combined types). Hot wire type & induction type , electrostatic type instruments.

UNIT – III

WATTMETERS & ENERGY METERS: Construction, operating principle, torque equation, shape of scale, errors, Advantages & disadvantages of Electrodynamic & induction type wattmeters; single phase induction type Energy meter, Compensation & creep in energy meter.

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POWE FACTOR & FREQUENCY METERS: Construction, operating principle, torque equation, advantages & disadvantages of Single phase power factor meters (Electrodynamics & moving iron types) & Frequency meters (Electrical Resonance type, Ferro dynamic & Electrodynamic types).

UNIT – IV

LOW & HIGH RESISTANCE MEASUREMENTS: Limitations of Wheat stone bridge; Kelvin's double bridge method, Difficulties in high resistance measurements, Measurement of high resistance by direct deflection, loss of charge method, Megohm Bridge & meggar.

A.C.BRIDGES: General balance = n, Ckt. Diagram, Phasor diagram, advantages, Disadvantages, applications of Maxwell's inductance, inductance-capacitance, Hays, Anderson, Owens, De-Sauty's, Schering & Weins Bridges, Shielding & earthing.

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. A Course in Elect. & Electronics Measurement & Instrumentation by A.K. Sawhney; Khanna Pub.

Reference Books:

1. Electronics Measurements by E.W. Golding
2. Electronics & Electrical Measurement & Instrumentation by J.B. Gupta Kataria & Sons.
3. Electronics Instrumentation & Measurement technique, W.D. Copper & A.d Helfrick.
4. Measuring Systems by E.O. Doblin; TMH.

EE-211-E ELECTRICAL MEASUREMENTS & MEASURING INSTRUMENTS

L **T** **P**
0 **0** **2**

Sessional: **25marks**
Theory: **25marks**
Total: **50 marks**

LIST OF EXPERIMENTS:

1. To identify the meters from the given lot.
2. To convert & calibrate a D'Arsonnal type galvanometer into a voltmeter & an ammeter.
3. To calibrate an energy meter with the help of a standard wattmeter & a stop watch.
4. To measure power & p.f. by 3-ammeter method.
5. To measure power & p.f. by 3-votmeter method.
6. To measure power & p.f. in 3-phase circuit by 2-watmeter method.
7. To measure capacitance by De Sauty's bridge.
8. To measure inductance by Maxwell's bridge.

9. To measure frequency by Wien's bridge.
10. To measure the power with the help of S.T & P.T.
11. TO measure magnitude & phase angle of a voltage by rectangular type potentiometer.
12. To measure magnitude & phase angle of a voltage by polar type potentiometer.
13. To measure low resistance by Kelvin's Double bridge.
14. To measure high resistance by loss of charge method.

Note: At least seven experiments should be performed from above list. Remaining three experiments may either be performed from above list or designed & set by concerned institution as per scope of syllabus.

EE-213-E ANALOG ELECTRONIS LAB

L **T** **P**
0 **0** **2**

Sessional: 25marks
Theory: 25marks
Total: 50 marks

LIST OF EXPERIMENTS:

1. Study of Half wave & full wave rectifiers.
2. Study of power supply filters.
3. Study of Diode as clipper & clamper.
4. Study of Zener diode as a voltage regulator.
5. Study of CE amplifier for voltage, current & Power gians and input, output impedance's.
6. Study of CC amplifier as a buffer.

7. To study the frequency response of RC coupled amplifier.
8. Study of 3-terminal IC regulator.
9. Study of transistor as a constant current source in CE configuration.
10. Study of FET common source amplifier.
11. Study of FET common Drain amplifier.
12. Graphical determination of small signal hybrid parameters of bipolar junction transistor.
13. Study & design of a D.C voltage doublers.

Note: At least Ten experiments are to be performed, at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set the concerned institute as per the scope of the syllabus.

EE-215-E ELECTRICAL MACHINE LAB-I

L	T	P
0	0	2

Sessional:	25marks
Theory:	25marks
Total:	50 marks

LIST OF EXPERIMENTS:

1. To find turns ratio of a 1-phase transformer.
2. To perform open & short circuit tests on a 1-phase transformer.
3. To perform Sumpner's Back to Back test on 1-phase transformer.
4. Parallel operation of two 1-phase transformers.
5. To convert three phase to 2-phase by Scott-connection.

6. To perform load test on DV shunt generator.
7. Speed control of DC shunt motor.
8. Swinburne's test of DC shunts motor.
9. Hopkinson's test of DC shunts M/Cs.
10. Ward Leonard method of speed control.

Note: At least ten experiments are to be performed, at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set the concerned institute as per the scope of the syllabus.

EE-217-E ANALOG ANALYSIS & SYNTEHSIS LAB

L	T	P
0	0	2

Sessional:	25marks
Theory:	25marks
Total:	50 marks

LIST OF EXPERIMENTS:

1. Transient response of RC circuit.
2. Transient response of RL circuit.
3. To find the resonance frequency, Band width of RLC series circuits.

4. To calculate and verify “Z” parameter of a two port network.
5. To calculate and verify “Y” parameter of a two port network.
6. To determine equivalent parameter of parallel connection of two port network.
7. To plot the frequency response of low pass filter and determine Half-power frequency.
8. To plot the frequency response of high pass filters and determines Half-power frequency.
9. To plot the frequency response of band-pass filters and determines the band width.
10. To calculate and verify “ABCD” parameters of a two port network.
11. To synthesize a network of a given network function and verify its response.

Note: At least ten experiments are to be performed, at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set the concerned institute as per the scope of the syllabus

EE-219-E ELECTRICAL WORKSHOP

L	T	P
0	0	2

Sessional:	25marks
Theory:	25marks
Total:	50 marks

LIST OF EXPERIMENTS:

1. Introduction of tools, electrical materials, symbols, and abbreviations.

2. To study stair case wiring.
3. To study house wiring i.e. battens, lests, casing-capping, and conduit wiring.
4. To study fluorescent tube light.
5. To study high pressure mercury vapor lamp (H.P.M.V)
6. To study Sodium lamp.
7. To study repairing of home appliance such as heater, electric iron, fans etc.
8. To study construction of moving iron, moving coil, electro-dynamics & induction type meters.
9. To design & fabricate single phase transformer.
10. To study fuses, relays, contactors, MCBs, and circuit breakers.
11. Insulation testing of electrical equipments.
12. To design, fabricate a PCB for a circuit, wire-up and test.

Note: At least ten experiments are to be performed, at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set the concerned institute as per the scope of the syllabus