BASICS OF ECONOMICS & MANAGEMENT

HUM – 201 E			Sessional	:	50
L	T	P	Theory	:	100
3	1	-	Total	:	150
			Duration of Exam.	:	3 Hrs.

UNIT-I

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 – II

Meaning of Management, Characteristics of Management, Management Vs. Administration, Management – Art, Science & Profession, Fayol's Principles of Management. Human relation approach , Functions of Management.

UNIT – III

Planning & Organizing - Planning, steps in planning , Planning premises, deference between planning policy & strategy, Authority & responsibility, centralization & decentralization.

UNIT – IV

Staffing, Directing & Controlling- Manpower planning , Recruitment & section 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 Economic Theory" Dewett, K.K., S. Chand & Co.
2. "Economic Analysis" K.P. Sundharam & E.N. Sundharam (Sultan Chand & Sons).
3. "Micro Economic Theory" M.L. Jhingan (Konark Publishers Pvt. Ltd.).
4. "Principles and Practices of Management " (L. M. Parshad Seth)
5. " Essentials of Management" Horold Kaontz.
6. "Organization and Management"R.D. Aggarwal, Tata McGraw Hill.

MATHEMATICS – III

MATH-201 E

L	T	P		Theory	:	100
3	1	-		Sessional	:	50
				Total	:	150
				Duration of Exam		: 3 Hrs.

UNIT – I

<u>Fourier Series</u> :   Euler's Formulae, Conditions for Fourier expansions, Fourier expansion of functions having points of discontinuity, change of interval, Odd & even functions, Half-range series.

<u>Fourier Transforms</u> : Fourier integrals, Fourier transforms, Fourier cosine and sine transforms. Properties of Fourier transforms, Convolution theorem, Perseval's identity, Relation between Fourier and Laplace transforms, Fourier transforms of the derivatives of a function, Application to boundary value problems.

UNIT-II

<u>Functions of a Complex Variables</u> : 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, Application to flow problems, Conformal transformation, Standard transformations (Translation, Magnification & rotation, inversion & reflection, Bilinear).

UNIT-III

<u>Probability Distributions</u> : 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

<u>Linear Programming</u> : Linear programming problems formulation, Solution of Linear Programming Problem using Graphical method, Simplex Method, Dual-Simplex Method.

Text Book
1.   Higher Engg. Mathematics : B.S. Grewal
2.   Advanced Engg. Mathematics : E. Kreyzig

Reference Book
1.   Complex variables and Applications : R.V. Churchil; Mc. Graw 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.

<u>Note</u> **:** Examiner will set eight question, taking two from each unit. Students will be required to attempt five questions taking at least one from each unit.

SEMICONDUCTOR DEVICES
IIIrd SEM. EEcT-201-E

L	T	P/D	TOTAL		Theory: 100 Marks
3	1	-	4		Sessional:50 Marks
					Duration: 3 hrs

UNIT-I Semiconductors: Band structure of semiconductor, Electron &hole distribution, current transport in semiconductor & concept about mobility, Diffusion & recombination, the continuity equation & it solution and Hall effect.
   Semiconductor technology : Introduction to technology of semiconductor devices , basic of ICs- Bipolar , MOS and CMOS type.

UNIT II P-N Junction Diodes : Structures technology , V-I characteristics , charge control equation and transient response . Types of P-N junction diode: Tunnel , Zener , Shockley , schottky, varactor diode & circuit : rectifiers , clipping and clamping circuits.
   Opto –Electronics : Basic of opto –Electronics , photo Diodes photo transistor , P-N Junction solar cells , LED , laser and photovoltaic device .

UNIT III   Bipolar Transistor: Ebers-Mole model & charge control model, Transient behavior, small signal equivalent circuit Z parameter–h-parameter and hybrid – pai, switching and power transistor.
   Field Effect Transistor: JFET operation and V-I characteristics, high frequency response , MOS capacitor theory , MOSFET types , MOSFET operation and V-I characteristics , equivalent circuit metal semiconductor junction and MOSFET.

UNIT IV Special semiconductor Device : Metal semiconductor contact ,MIC structure surface charge transfer and charge coupled device and their applications.
   Semiconductor power devices : Diodes, transistors, UJT, thyristor, DIAC, TRIAC,GTO,IGBT static   characteristics. and principal of operation .

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

RECOMMENDED BOOKS :
1. B.G. Streetman : Solid State Electronic Devices (PHI)
2. S.M. Sze: Physics of Semiconductor Devices (WILEY)
3. D. Nagchoudhari :   Semiconductor Devices(TMH)
4. P.S. Bimbhra :   Power Electronics(KP)
5. Dubey G.K. : Thyristorised Power Controllers (NAIL)

NETWORK ANALYSIS & SYNTHESIS
EE-203-E

L T P	Sessional	:	50	Marks
3 1 0	EXAM	:	100	Marks
	TOTAL	:	150	Marks
	DURATION OF EXAM	:	3 HRS	

UNIT I

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 2

NETWORK FUNCTIONS :
Terminal pairs or Ports, Network functions for one-port and two-port networks, poles and zeros of Network functions, Restrictions on pole and zero Locations for driving point functions and transfer functions, Time domain behavior from the pole-zero plot.

UNIT 3

CHARACTERISTICS AND PARAMETERS OF TWO PORT NETWORKS :
Relationship of two-port variables, short-circuit Admittance parameters, open circuit impedance, parameters, Transmission parameters, hybrid parameters, relationships between parameter sets, Inter-connection of two port networks.

UNIT 4

TYPES OF FILTERS AND THEIR CHARACTERISTICS :
Filter fundamentals, high-pass, low-pass, band-pass, and band-reject Filters.
NETWORK SYNTHESIS :
Positive real functions, synthesis of one port and two port networks, elementary ideas of Active networks.

TEXT BOOKS:

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

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

PRINCIPLES OF COMMUNICATION ENGG.
EM-III EEcT-203-E

L   T   P   Theory   : 100 Marks

3   1   -   Sessional : 50 Marks

Duration :   3hrs

UNIT I- NOISE:- Classification Noise, Various sources of Noise, Methods of Noise Calculation in networks and interconnected networks. Addition of noise due to several sources; noise in amplifiers in cascade,, noise in reactive circuits, Noise figure, its calculation and measurement. Noise temperature, Mathematical representation of random noise, narrow band noise and its representation. Transmission of noise through linear systems, signal to noise ratio, noise-bandwidth.

UNIT II - **MODULATION TECHNIQUES**: Basic constituents of Communication Systems, need of modulation, Amplitude modulation, spectrum AM Wave , modulation index, DSBSC modulation, Collector modulation, Square law modulation methods of generating SSB Signals, vestigial side band modulation, Detection of AM Signal; Diode detector, Square Law Detector. Time Constant RC in diode detector. Diode detector with filter. FDM, Power relations in AM wave.

UNIT III – **ANGLE MODULATIN**: Frequency and phase modulation, spectrum of FM Wave, modulation index and Bandwidth of FM Signal, NBFM and WBFM, Comparison between FM and PM Signals, FM and AM signals, AM and NBFM signals, FM generation methods, Demodulation methods; slope detector, ratio detector, Foster-Secley discriminator. Pre-emphasis & De-emphasis, effect of noise on carrier; noise triangle.

UNIT IV- TRANSMITTER AND RECEIVER: Classification of radio transmitters, Block diagram of AM transmitter, Frequency Scintillation, Frequency drift, Radio broadcast transmitter, Radio telephone transmitter, Privacy devices Armstrong FM transmitter, Simple FM transmitter using Reactance modulator. Classification of radio receivers, TRF receives, superheterodyne receivers, Image Signal rejection, frequency mixers. Tracking and alignment of receivers, Intermediate frequency, AGC, AFC, SSB receiver.

NOTE:

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

Books recommended:
1. Principle of communication of engineering : By Umesh Sinha.
2. Communication system   By R.Singh & S. D. Sapre (TMH)
3. Electronics communication system   By George Kenddy (TMH)
4. Communication system   B**y** Taub Schilling.(TMH)
5. Communication Engineering   By W.I.Everitt.& G. E. Anner (MGH)
6. Principle of communication System By Taub &b Schilling , (TMH)
7. Radio Engineering   By Mithal G.K. (Khanna Pub.)
8. Communication System   By John Wiley

POWER APPARATUS AND MACHINE-1
IIIrd Sem. EEcT-205-E

L	T	P/D	Total		Theory:	100 Marks
4	1	-	5		Sessional :	50 marks
					Duration : 3 hrs	

UNIT-I   Principles of Electro- Mechanical energy conversion: Basic Principle, energy, force and torque of singly, multiply excited system, reluctance torque, basic rotating machine, distribution and harmonics in mmf. and e.m.f. of dc and ac machines, revolving field, torque production, asynchronous and synchronous torque.

UNIT-II D.C.Machines: Principles of e.m.f. and torque production, function of commutator, methods of excitation.
Operation of generators: interactions of armature and excitation fields, effects of brush shift, compensating winding, Characterististics of various generators, simple ideas of parallel operation.
Operation of Motor: Method of excitation, Characteristics, Speed control and starting methods, testing, losses and efficiency. Armature reaction and commutation.

UNIT III   Transformer: Principle, Construction, equivalent circuit and phasor diagram of single phase transformer, determination of equivalent circuit parameters, regulations, losses and efficiency. Various types of connections for three phase transformer, their comparative features, parallel operation of single phase and three phase transformers. Auto transformer: Principle, application and comparison with 2-winding transformer.
Nature of magnetizing current, harmonics, construction of 3-phase transformer.
Phase conversion:3-2 phase and 3-6 phase conversion. Three winding transformer, phase shifting, tap changing in transformers and induction regulator.

UNIT IV Single Phase Motors: Single phase induction motor, double revolving field theory, equivalent circuit and determination of parameters, single phase synchronous motors.

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

RECOMMENDED BOOKS:
1. Nagrath & Kothari: Electric Machines (TMH)
2. Langsdorf: A.C.Machines (TMH)
3. Fitzgerald and Kingsley: Electrical Machinery (MGH)
4. P.S. Bimbhra: Electrical Machinery (KP)
5. Dennis O' Kelly   Performance and Control of Electrical Machine
6. Nagrath & Kothari: Theory and problem of Electrical Machines(TMH)

L	T	P/D	Total		Theory :	100 Marks
3	1	-	4		Sessional:	50 Marks
					Duration:	3 hrs

UNIT –I   **Classification of Signals & Systems:** Definition & concept of different types of , signal, impulse sequence, other singularity functions, system: classifications of system, superposition system, casual and non-casual system, memory & memory less system, representation of continuous time & discrete time, signal & system, time invariance & causality, concepts of linearity & stability, LTI system(Continuous-time & discrete time type), properties of LTI system, response of linear system to random signal inputs, system modeling in terms of differential & different equations, methods for solving such equations, state variable representation multi input & multi output discrete/continuous \ representation multi input & multi output discrete/continuous representation. Random process band limited process , Gaussian & related process, discrete System.

UNIT-II   **Properties of Signal & Systems:** Correlation function, autocorrelation & their properties, convolution sum, convolution integral & their evolution time domain representation and analysis of LTI system in terms of convolution sum & convolution-integral, Parseval's theorem for energy & power signals, energy spectral density, power spectrum density, system function(transfer function).

UNIT-III   **Transform Domain Considerations:** Laplace transform of various signals, properties of Laplace transform & their application to system analysis, inverse Laplace transform spectral analysis, Fourier series & Dirichlet condition existence, convergence & consequences, Fourier transform to various signals & their properties (Fourier series & Fourier transform) application to system analysis, convolution & multiplication in Fourier & Laplace transforms, convergence in lapalce transforms, convergence in lapalce & Fourier transform.

UNIT-IV   **(a) Z- Transform:** Introduction to Z-transform & properties of z- transform & properties of Z- transform, poles & zero of the Z- plane notions of convergence, techniques of inversion & related concepts, applications of Z- transform to analysis & characterization of discrete time system, interaction with lapalce & fourier transform.
(b) Sampling: Discrete representation of continuous signal sampling sampling theorem & its proof sampling & recovery of the signal, the effect of under sampling, digital simulation of analog system.

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

RECOMMENDED BOOKS:
1.A.V.Oppenhiem, A.S. Winsky: Signal & Systems(PHI).
2. R.P. Singh & Sapre: Communication Systems(TMH).
3. John Prokais: Digital Signal Processing(PHI).
4.R.F.Ziener,W.H.Traiter &   Signal & system-Continuous & Discrete.
   D.R. Fanin (Macmillan) 5. Fred J. Taylor: Principles of signal & systems by(MGH).
6.Simon Haykins: Signal & Systems(Wiley Eastern).

POWER APPARATUS & MACHINE LAB-I
III SEM. EEcT-209-E

L T P   Sessional : 50Mks
-   - 3   Practical : 50 Mks
                    Total   : 100 Mks
                    Duration : 3hrs

1. To perform load test on a single phase transformer and plot graph between load current & efficiency.
2. To perform O.C. & S.C. test on a single-phase transformer.
3. To carry out speed control on DC shunt motor (Armature & Field control)
4. To obtain magnetizing characteristics of a separately exited DC generator and hence calculate critical resistance and critical speed.
5. To draw the load characteristics of a DC shunt /Compound Generator (I) shunt, (II) Cumulative Compound (III) Differential Compound.
6. To determine the efficiency of a DC machine by Swinburn test.
7. To transform power from 3- phase system to 2- phase system using Scott connection transformer.
8. To draw the equivalent circuit of 1- phase transformer from the result of open circuit test & short circuit test and estimate the regulation and efficiency of a transformer from test data.
9. To perform parallel operation of single-phase transformer.
10. To control speed of D.C. machine using Ward Leonard method.

SEMICONDUCTOR DEVICES LAB
IIIrd SEM. EEcT-211-E

L   T   P   **Sessional :   25 Mks**
-     -   2   Practical   :   25 Mks
                                                     Duration   :   3 hrs.
                                                     Total   : 50 Mks

List of Experiments :

1. Draw V.I characteristics of P.N.junction diode in forward bias region & study of L.E.D characteristics.
2. To study the reverse breakdown characteristics of given zener diodes as a voltage regulator.
3. To study the input and output characteristics of a given transistor in common emitter configuration
4. To study the static characteristics of a given JFET & evaluate parameters r_d, I_{dss}, Vpo , gm , μ .
5. Verify the Truth Table of And ,OR ,XOR , NOT Logic gates.
6. To study half wave rectifier , Full wave rectifier & bridge rectifier and effect of different filter circuits on ac ripple at different loads.
7. To study the inverting and non – inverting amplifier using op-amp .
8. (a) To understand the function of each subsystem of the Oscilloscope and the proper use of each of its controls
     (b) To measure the voltage and frequency.
9. To study the UJT as relaxation oscillator and to observe the effect of RC time constant upon output pulse.
10. To measure h- parameters of given transistor ac128 in common emitter configuration at 1 KHz.

SIGNALS AND SYSTEMS LAB
III rd SEM. EEcT-213-E

L   T   P   Theory : 25 Mks

-     -   2   Practical: 25 Mks

Duration : 3 hrs.

Total   : 50 Mks

1.To study Z- transform of ;
     a) Sinusoidal signals.
     b) Step functions.

2.To compare fourier and laplace transform of a signal.

3.To study convolution theorem in time and frequency domain.

4. To Study Signal Synthesis via sum of harmonics.

5. To study LPF &HPF,band pass& reject filters using RC circuits.

6 . To demonstrate how analog signals are sampled & how different
     sampling rates affect the outputs.

7.To study sampling theorem for low pass signals & band pass signals .

8. To determine the components of :
     a) Square wave.
     b) Clipped sine wave.

ELECTRICAL WORKSHOP
EE-219-E

L T P   Sessional   :   25   Marks
0   0 3   EXAM   :   25   Marks
                                            TOTAL   :   50   Marks
                                            DURATION OF EXAM   :   3 HRS

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., batten, cleat, casing-caping and conduit wirings.

4.   To study fluorescent tube light.

5.   To study high pressure mercury vapour lamp (H.P.M.V).

6.   To study Sodium lamp.

7. To study repairing of home appliances such as heater, electric iron, fans etc.

8. To study construction of moving iron, moving coil, electrodynamics & 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: Ten experiments are to be performed, out of which at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution.