# B.E.MBA integrated in ELECTRICAL & ELECTRONICS
## III SEMESTER

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**Note:**
*marks refer to mid semester evaluation and end semester evaluation.
AS 301
Engineering Mathematics – III

External: 50
Sessional: 50
Credits: 4

Course Duration: 45 lectures of one hour each.

Note for Examiner: Examiner will set 7 questions of equal marks. First question will cover whole syllabus, having 5 conceptual questions of 2 marks each and is compulsory. Rest of the paper will be divided into two parts having three questions each and the candidate is required to attempt at least two questions from each part.

PART A


(8 Lectures)


(7 Lectures)

Eigen values, eigen vectors, Cayley – Hamilton theorem (statement only). Similarity of matrices, Basis of eigenvectors, diagonalization (Scope as in Chapter 7, Sections 7.1, 7.5 of Reference 1).

(7 Lectures)

PART B

Complex Functions: Definition of a Complex Function, Concept of continuity and differentiability of a complex function, Cauchy – Riemann equations, necessary and sufficient conditions for differentiability (Statement only). Study of complex functions: Exponential function, Trigonometric functions, Hyperbolic functions, real and imaginary part of trigonometric and hyperbolic functions, Logarithmic functions of a complex variable, complex exponents (Scope as in Chapter 12, Sections 12.3 – 12.4, 12.6 – 12.8 of Reference 1).

(8 Lectures)

Laurent Series of function of complex variable, Singularities and Zeros, Residues at simple poles and Residue at a pole of any order, Residue Theorem (Statement only) and its simple applications (Scope as in Chapter 15, Sections 15.1 – 15.3 of Reference 1).

(7 Lectures)

Conformal Mappings, Linear Fractional Transformations (Scope as in Chapter 12, Sections 12.5, 12.9 of Reference 1).

(8 Lectures)

References:

**EE- 301**

**ELECTRIC MACHINERY-I**

External: 50  
Sessional: 50  
Credits : 4

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**Part-A**

1. **Transformers**  

2. **Direct Current Machines**  
   **Generators:** Mechanical construction, Armature windings, Induced emf equation, Developed torque, Magnetization characteristics, Theory of commutation, Armature reaction, Types of d.c. generators, Voltage regulation, Losses, Separately excited, shunt, series and compound generators and characteristics, Maximum efficiency criterion.

   **Motors:** Operation, Speed regulation, Losses, Series, shunt and compound motors, methods of speed control, Ward Leonard method, Braking or Reversing d.c. motors. [Guru-Hiziroglu: 5.1-6.11]

(10 hours)

**Part-B**

3. **Polyphase Induction Machines**  

   **Induction Generator:** Motor to generator transition, Induction generator starting and operation with other three phase sources, Isolated generator operation and voltage build up. [Hubert : 5.18]

(15 hours)

4. **Single Phase Induction Motors**  
   Double revolving field theory, Analysis of single phase induction motor and speed torque characteristics, Split Phase, Capacitor start, Capacitor start capacitor run motor, Permanent split capacitor motor, Shaded pole motor, Testing of single phase induction motor: No load and block rotor tests. [Guru-Hiziroglu:10.1-10.4, 10.6-10.7]  

(8 hours)

**Text book:**


**Other Recommended Books:**

EE- 351

ELECTRIC MACHINERY-I LAB

Marks: 50
Credits : 2

L T P 0 0 3

Note: At least eight experiments to be done.

1. Open circuit and short circuit test of single phase/ three phase transformer and obtain its equivalent circuit.
2. Parallel operation of two single phase transformers.
4. Different winding connections of three phase two winding transformer and to identify proper combination for parallel operation.
5. Parallel operation of two three phase transformers.
8. Efficiency at different loads of the given dc shunt machine through swinburne / load test.
9. Speed control characteristics of a given dc shunt motor by (i) Armature control (ii) Field control.
10. No load and blocked rotor test on a three phase induction motor and to obtain its Equivalent circuit
11. Torque speed characteristics of three phase induction motor.
EE-302

ELECTRICAL MEASUREMENTS & INSTRUMENTATION

External: 50            L T P
Sessional: 50            3 1 0
Credits : 4

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PART-A

1. Units, Standards & Errors
   Different types of unit systems: cgs, mks and SI units, Standards of EMF, Resistance, Capacitance and inductance, Systematic errors.
   (6 hours)

2. Analog Measuring Instruments
   Different types of analog instruments, Operating torques and their systems, T/W ratio, Pointers & scales, Principles of operation of various types of electro mechanical indicating instruments viz. PMMC, Moving iron, Dynamometer and Induction for measurement of various electrical quantities, Sources of errors & their compensation, Shunts & multipliers.
   (12 hours)

3. Potentiometers
   Basic potentiometer circuit, Lab type potentiometer, Multiple range potentiometer, Constructional details of potentiometers, Applications of d-c potentiometers; Self balancing potentiometers, AC potentiometers: Polar and Coordinate types.
   (6 hours)

PART-B

4. Bridges
   (10 hours)

5. Sensors and Transducers
   Sensors: Primary sensing elements, Their characteristics and classification.
   Passive transducers: Configurations, Analysis and applications of Resistive, Inductive and Capacitive transducers.
   Active transducers: Principle, Construction, Analysis and Applications of thermoelectric, Electromagnetic, Piezo-electric and photoelectric transducers.
   (6 hours)

6. Analog Signal Conditioning
   Instrumentation amplifiers: Circuit diagram, Working, Uses and applications.
   Logarithmic amplifiers: Circuit diagram, Operating principle, Working and applications.
   (5 hours)
TEXT BOOK


OTHER RECOMMENDED BOOKS

W.D. Cooper, “Electronic Instrumentation & Measurement Techniques,” PHI.

EE-352

ELECTRICAL MEASUREMENTS & INSTRUMENTATION LAB.

Marks: 50            L T P
Credits : 1                     0 0 2

Note: At least eight experiments to be done.

5. To measure the characteristics of strain gauge as a transducer using half bridge and full bridge.
6. To measure the characteristics of pressure sensor as a transducer.
7. To study piezoelectric effect and perform tests on piezoelectric transducer.
8. To measure the characteristics of displacement transducer using LVDT & inductive transducer.
9. To study various features of LabVIEW software.
10. To perform arithmetic & logical operations using LabVIEW.
11. To generate a graph & sub-VI using Lab VIEW.
12. Using case structure, generate a program to A.P. & G.P. in Lab VIEW.
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PART-A

1. Methods of analyzing A.C. Circuits
   Formulation of network equations, Source transformation Nodal Analysis: Node voltages, matrix node equations, Mesh Analysis: Mesh currents, matrix mesh equations, Network Theorems: Superposition, Thevenin’s, Norton’s, Maximum Power Transfer theorem, three phase unbalanced circuit analysis, Solution of Problems with DC & AC sources.

   (10 hours)

2. Network Topology
   Introduction, Network Graph, Tree and Co-tree, Twigs and Links, Incidence Matrices and its properties, Link currents: Tie-Set Matrix, Cut-Set and Tree Branch Voltages, Solution of Problems.

   (7 hours)

3. Two-Port Networks
   Introduction, Open Circuit Impedance Parameter, Short Circuit Admittance Parameter, Transmission Parameter, Inverse Transmission Parameter, Hybrid Parameter, Interrelationship of different parameters, Inter-Connection of Two-Port Networks, Terminated Two-Port Network, T and Π representation, solution of problems.

   (8 hours)

PART-B

4. Laplace Transform Analysis
   Definition of Laplace Transform, Step function, Impulse function, Periodic function, Inverse transform, initial and final value theorem, Circuit Elements in the S-Domain, Solution of problems with DC & AC sources. Transfer Functions: Circuit Analysis, Convolution and Impulse Response.

   (10 hours)

5. Network Functions and s-Domain Analysis

   (10 hours)

TEXT BOOKS

Other Recommended Books

EE-356
Network Analysis and Synthesis Lab

Marks: 50            L T P
Credits : 2                     0 0 3

2. Find impedance, admittance, transmission and hybrid parameters of the two port network.
4. To determine phase sequence of three phase supply system and to find the line currents for three phase three wire load when the sequence is i) RYB ii) RBY.
5. To make 3-phase unbalanced network with neutral return of known impedance. Measure phase currents, neutral currents and the potential difference between the load and supply neutral.
6. To check the polarity marking of a transformer and to determine self inductance of each winding and mutual inductance between the windings.
8. To obtain capacitor voltage vs. time curve and time constant of an RC circuit when It is switched on to dc supply. Capacitor is discharged through the resistance
9. study the current build up and current decay in RL / RC circuit by obtaining its response to a square wave input.
10. Simulation of dc circuits using Pspice.
11. DC Transient response using Pspice.
EE – 306
DIGITAL ELECTRONICS

External: 50
Sessional: 50
Credits : 4

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PART-A

1. Introduction
   Concept of digitisation, Representation of Logic, Logic Variables, Boolean Algebra, Boolean Expressions and minimization of Boolean expression using K-Map(up to five variables), Review of Logic Gates, design & Implementation of Adder, Subtractor, Multiplexer, DeMultiplexer, Encoder, Decoder, ROM, Digital Comparators, Code Converters using gate, multiplexers / decoders

   (10 hours)

3. Flip-Flops
   A 1- bit memory cell, clocked & unclocked flip flop, S-R Flip-Flop, JK Flip-Flop, Race around Condition, Master Slave Flip-Flop, D&T type Flip-Flop

   (04 hours)

4. Counters & Shift Registers
   Ripple Counters, Design of Modulo-N ripple counter, Presettable Counters, Up-Down counter, design of synchronous counters with and without lockout conditions, design of shift registers with shift-left, shift-right & parallel load facilities, Universal shift Registers.

   (10 hours)

PART-B

5. Data Converters
   Sample & Hold switch, D/A converters: weighted resistor type, R-2R Ladder type; A/D Converters: Counter-Ramp type, Dual Slope Type, Successive approximation type, flash type; Specifications of ADC & DAC

   (6 hours)

6. Digital Logic families
   Characteristics of digital circuits: fan in, fan-out, power dissipation, propagation delay, noise margin; Transistor-transistor Logic(TTL), manufacturer Data Sheets & Specifications, Types of TTL Gates (Schottky, standard, low power, high speed). Emitter Coupled Logic(ECL), Manufacturers Data sheets & Specifications, Comparison of Characteristics of TTL and ECL, Tristate Logic & its applications.

   (5 hours)

7. Semiconductor Memories & Programmable Logic
ROM, PROM, EPROM, EEPROM; RAM: Static RAM, Typical Memory Cell, Memory Organisation, Dynamic RAM cell, Reading, & Writing Operation in RAM, PLA, PAL & FPGA

(10 hours)

TEXT BOOKS RECOMMENDED:
1. T. Schilling, “Digital Electronics”

OTHER RECOMMENDED BOOK

EE - 357
DIGITAL ELECTRONICS LAB
Marks: 50 Credits : 1
L T P 0 0 2

Note: At least six experiments to be done.

Note: At least eight experiments are to be done.

List of Experiments
1. To verify the truth tables of basic gates.
2. To verify NAND and NOR as universal gates.
3. To realize adder and subtractor using logic gates.
4. To design and implement SR, JK, D and T flip flops.
5. To perform arithmetic & Logic operations on two 4-bit binary numbers using an ALU.
6. To design and implement synchronous counter.
7. To design and implement a Modulo N counter.
9. To design and implement a universal shift register.
10. To convert 8 bit Digital data to Analog value using DAC
11. To convert Analog value into 8 bit Digital data using ADC

IBM 301
Organization Behavior
External: 50 Credits : 3
Sessional: 50 L T P 3 0 0

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parts having three questions each and the candidate is required to attempt at least two questions from each part.

**Part A**

**Introduction to Organization Behavior**

Definition and meaning of OB, impact of other sciences (Anthropology, Sociology, Psychology) on OB, perception, self esteem, attitude & personality, meaning of culture, impact of technology on OB.

**Motivation, Learning & Leadership**

Meaning of Motivation, Content theories of motivation (Maslows Hierarchy of needs, Herzberg’s two factor theory), Process theories (Vroom’s Expectancy theory, Porter-Lawler Model), Motivation applied (Job design, job rotation, goal setting, MBO), various methods of motivating employees, Behavioral & Cognitive theories of learning, Leadership theories (Trait theory, Fiedler’s Contingency theory, Path–Goal leadership theory), Leadership styles (Blake & Mouton managerial grid, Hersey & Blanchard’s life cycle approach).

**Part B**

**Group behavior:**

Group Dynamics, conflict, power & politics, Group behavior, types of groups, group decision making, conflict in organizations and reason, interpersonal conflict, inter group conflict, meaning of power, classification of power, politics in organizations.

**Organization environment & Communication**

Authority & responsibility, delegation and division of work, quality of work life, communication process, modes of communication in organization and barriers to communication, formal & informal communication.

**Recommended Books:**
