
MATHEMATICS – IV

Sub Code : P08MA41
Hrs/week : 04
Lecturer Hrs : 52

L:T:P: 4:0:0

CIE Marks : 50
Exam Hrs : 03
SEE Marks : 50

Unit – 1 COMPLEX VARIABLES : Introduction to functions of complex variables. Limit, continuity and differentiability-definitions. Analytic functions. Cauchy–Riemann equations in cartesian and polar forms. Properties of analytic functions. Construction of analytic function: Milne-Thomson method. Conformal transformation – definition. Discussion of transformations:

$w = z^2$, $w = e^z$, $w = z + \frac{1}{z}$ ($z \neq 0$). Bilinear transformations.

07 Hrs

Unit – 2 COMPLEX INTEGRATION : Complex line integrals. Cauchy’s theorem, Cauchy’s integral formula. Taylor’s and Laurent’s series (Statements only). Singularities, poles and residues. Cauchy’s residues theorem (statement only). Simple illustrative examples.

06 Hrs

Unit – 3 SERIES SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS AND SPECIAL FUNCTIONS : Series solution - Frobenius method. Series solution of leading to $J_n(x)$ - Bessel’s function of first kind. Equations reducible to Bessel’s differential equation. Series solutions of Legendre’s differential equation leading to $P_n(x)$ - Legendre’s polynomials. Rodrigue’s formula.

06 Hrs

Unit – 4 STATISTICS : Brief review of measures of central tendency and dispersion Moments, skewness and kurtosis. Curve fitting – least square method : $y = a + bx$; $y = ab^x$; $y = ae^{bx}$, $y = ax^b$ and $y = ax^2 + bx + c$. Karl Pearson’s coefficient of correlation and regression lines.

07 Hrs

Unit – 5 PROBABILITY: Introduction. Sample space and events. Axioms of probability. Addition and multiplication theorems. Conditional probability – illustrative examples. Bayes’s theorem-examples. Random variables (discrete and continuous)- Introduction to probability distributions- p.d.f., c.d.f. – examples

06 Hrs

Unit – 6 PROBABILITY DISTRIBUTIONS OF SINGLE RANDOM VARIABLE: Discrete probability distributions – Binomial, Poisson’s and geometric distributions; Continuous probability distributions - uniform, exponential and normal distributions.(No derivation of mean and variance). Illustrative examples from engineering and industrial fields. **06Hrs**

Unit – 7 JOINT PROBABILITY DISTRIBUTIONS AND MARKOV CHAINS: Concept of joint probability. Joint probability distributions of discrete random variables. Expectation, covariance, correlation coefficient. Markov chains: Probability vectors, stochastic matrices. Fixed point and regular stochastic matrices. Markov chains, higher transition probabilities. Stationary distribution of regular Markov chains and absorbing states. **07Hrs**

Unit – 8 LINEAR ALGEBRA: Rank of matrix by elementary row operations. Echelon matrices. Consistency of system of linear equations - Gauss elimination method. Gauss- Seidal iterative method. Illustrative examples. Definition of eigen values and eigen vectors of a square matrix. Determination of largest eigen value and corresponding eigen vector by power method. **07 Hrs**

Text Books

1. Higher Engineering Mathematics:- B.S. Grewal, Khanna Publishers, 40th Edition- 2007.
2. Engineering Mathematics:- by N.P.Bali and Manish Goyal, Laxmi Publications, 7th Edn., 2007.
3. Probability:- Seymour Lipschutz, Schaum’s outline series, McGraw-Hill publications, 2nd Edition, Chapters 5 and 7 (for Unit VII).

Reference Books

1. Advanced Modern Engineering Mathematics:- Glyn James, Pearson Education Ltd., 3rd Edition, 2007.
2. Advanced Engineering Mathematics: - E. Kreyszig, John Wiley & Sons, 6th Ed.2007.

APPLIED THERMODYNAMICS

Sub Code : P08ME 42
Hrs/week : 04
Lecturer Hrs : 52

L:T:P: 4:0:0

CIE Marks : 50
Exam Hrs : 03
SEE Marks : 50

PART-A

Unit 1: COMBUSTION THERMODYNAMICS: Theoretical (Stoichiometric) air for combustion of fuels, Excess air, mass balance, actual combustion. Exhaust gas analysis, A/F ratio. Energy balance for a chemical reaction, enthalpy of formation, enthalpy and internal energy of combustion, Combustion efficiency. **07 Hrs**

Unit 2: AIR STANDARD CYCLES: (Gas power cycles) Carnot, Otto, Diesel, Dual and sterling cycles, p-v and T-s diagrams, description, efficiencies and mean effective pressures. Comparison of Otto, Diesel and Dual cycles. **06 Hrs**

Unit 3: VAPOUR POWER CYCLES: Carnot vapour power cycle, drawbacks, Simple Rankine cycle, description, T-s diagram, analysis for performance, Comparison of Carnot and Rankine cycles. Effects of pressure and temperature on Rankine cycle performance. Analysis of Reheat Cycle, regenerative cycle, Ideal and practical regenerative Rankine cycles, open and closed feed water heaters. **07 Hrs**

Unit 4: GAS TURBINES, STEAM NOZZLES AND JET PROPULSION: Brayton cycle for a gas turbine power plant, open and closed type. Deviations of practical gas turbine cycles from ideal cycles. Variations of Brayton cycle like Regeneration, reheating and Inter-cooling, Jet propulsion, turbo jet, ramjet and turbo prop engines **06 Hrs**

PART-B

Unit 5: RECIPROCATING AIR COMPRESSORS: Operation of a single stage reciprocating air compressors, Work input using p-v diagram and steady state flow analysis, Effect of clearance and volumetric efficiency, Adiabatic, isothermal and mechanical efficiencies, Multistage compressors, saving in work, expression for optimum intermediate pressure. Imperfect inter cooling. **07 Hrs**

Unit 6: REFRIGERATION AND HEAT PUMP: Introduction, Heat Engines and Heat Pumps, Pressure- enthalpy diagram. Vapour compression refrigeration systems, description, analysis, refrigerating effect, capacity, power required units of refrigeration, and COP. problems
Principle of working of vapour absorption refrigeration system, Steam jet refrigeration system and Air cycle refrigeration. **06 Hrs**

Unit 7: PSYCHOMETRICS AND AIR CONDITIONING: Atmospheric air and psychometric properties, Dry bulb temperature, wet bulb temperature, dew point temperature, partial pressures, specific and relative humidity and relation between them, Enthalpy and adiabatic saturation temperature, Construction and use of psychometric chart. Analysis of various processes such as heating, cooling, dehumidifying, humidifying. Air conditioning systems, summer and winter air conditioning. **07 Hrs**

Unit 8: I.C. ENGINES: Testing of two-stroke and four stroke SI and CI engines for performance, related numerical problems, heat balance, Morse test. **06 Hrs**

TEXT BOOKS:

1. Introduction to Classical Thermodynamics by Van and Wylen
2. Engineering Thermodynamics –by Dr.R.K.Rajput, Laxmi Publications.

REFERENCE BOOKS:

1. Thermodynamics-An engineering approach by Yunus A. Cengel Tata McGraw Hill Pub. Co
2. Applications of Thermodynamics by Bernard D.Wood, Addison Wesley, 2nd Ed. 1974.
3. Thermodynamics By B.S.Sarkar.
4. Internal Combustion Engines by M.L.Mathur and R.P.Sharma, Dhanpat Rai Pub. 2000.
5. Engineering Thermodynamics by Spalding and Cole, ELBS Edition.
6. Engineering Thermodynamics by Prakash and Gupt.
7. Engineering Thermodynamics by P.K.,Nag, Tata McGraw Hill Pub. Co.

SCHEME FOR END SEMESTER EXAMINATION:

One question to be set from each unit. Students have to answer any FIVE full questions out of EIGHT questions, choosing at least 2 questions from part A and 2 questions from part

MECHANICAL MEASUREMENTS AND METROLOGY

Sub Code: P08ME 43
Hrs/week: 04
Lecture Hrs: 52

L:T:P: 4:0:0

CIE Marks : 50
Exam Hrs: 03
SEE Marks: 50

PART – A

Unit 1: STANDARDS OF MEASUREMENT: Definition and Objectives of metrology, subdivision of standards, line and end standard. Imperial standard yard, wave length standard transfer from line to end standard. Calibration of end bars, Slip gauges, wringing phenomena, numerical problems on building of slip gauges, International Protometer. **06 Hrs**

Unit 2: SYSTEM OF LIMITS, FITS, TOLERANCES AND GAUGING: Definition of tolerance, specification in assembly, principle of inter changeability and selective assembly. Concept of limits of size and tolerances, compound tolerances, accumulation of tolerances. Definition of fits, types of fits. Hole basis system and shaft basis system. Classification of gauges, brief concept of design of gauges (Taylor's principles), wear allowance on gauges. Types of gauges -plain plug gauge, ring gauge, snap gauge, gauge materials. **08 Hrs**

Unit 3: COMPARATORS AND ANGULAR MEASUREMENTS: Introduction to Comparators, characteristics and classification of comparators. Mechanical comparators-Johnson Mikrokator, Sigma Comparators, Optical Comparators -principles, Zeiss ultra optimizer, Electric and Electronic Comparators , LVDT, Pneumatic Comparators, Solex Comparator. Back Pressure gauges Principle and. use of Sine bars, Sine center, angle gauges, Clinometers. **06 Hrs**

Unit 4: SCREW THREAD GEAR MEASUREMENT AND INTERFEROMETER: Terminology of screw threads, measurement of major diameter, minor diameter, pitch, angles and effective diameter of screw threads by 2-wire and 3-wire methods, best size wire. Toolmakers microscope, gear terminology, use of gear tooth Vernier caliper and gear tooth micrometer. Principle of interferometry, autocollimator, optical flats. **06 Hrs**

PART – B

Unit 5: MEASUREMENTS AND MEASUREMENT SYSTEMS: Definition, significance of measurement, generalized measurement system, definitions and concept of accuracy, precision, calibration, threshold, sensitivity, hysteresis, repeatability, linearity, loading effect, system response-times delay. Errors in Measurements, classification of Errors. Transducers, Transfer efficiency, Primary and Secondary transducers, classification of transducers with examples. Advantages of each type transducers. **08 Hrs**

Unit 6: INTERMEDIATE MODIFYING AND TERMINATING DEVICES: Mechanical systems, inherent problems, Electrical intermediate modifying devices, input circuitry, ballast, electronic amplifiers and telemetry. Terminating devices, Mechanical Cathode Ray Oscilloscope, Oscillographs, X-Y Plotters. **06Hrs**

Unit 7: MEASUREMENT OF FORCE, TORQUE AND PRESSURE: Basic principles, analytical balance, Platform balance, proving ring, Torque measurement, Pony brake, hydraulic dynamometer. Pressure measurements, Basic principles, use of elastic members, Bridgeman gauge, McLeod gauge, Pirani Gauge. **06Hrs**

Unit 8: TEMPERATURE AND STRAIN MEASUREMENT: Resistance thermometers, thermocouple, law of thermocouple, materials used for construction, pyrometers, Optical Pyrometer. Strain gauges, preparation and mounting of strain gauges, gauge factor, methods of strain measurement. **06 Hrs**

TEXT BOOKS:

1. "Mechanical measurements", by Sirohi and Radakrishna.
2. "Engineering Metrology" by R.K.Jain, Khanna Publishers

REFERENCE BOOKS:

1. "Engineering Metrology" by I.C.Gupta, Dhanpat Rai Publications, Delhi
2. "Mechanical measurements" by R.K.Jain
3. "Industrial Instrumentation" Alsutko, Jerry. D.Faulk, Thompson Asia Pvt. Ltd.2002
4. "Mechanical measurements", by Doblin, McGraw Hill Publications
5. "Mechanical measurements" by Beckwith Marangoni and Lienhard, Pearson Education, 6th Ed., 2006

SCHEME FOR END SEMESTER EXAMINATION :

One question to be set from each unit. Students have to answer any FIVE full questions out of EIGHT questions, choosing at least 2 questions from part A and 2 questions from part B.

THEORY OF MACHINES-I

Sub Code: P08ME 44

Hrs/week: 04

Lecture Hrs: 52

L:T:P: 4:0:0

CIE Marks : 50

Exam Hrs: 03

SEE Marks: 50

PART- A

Unit 1: INTRODCTION: Rigid & Resistant bodies, kinematics pairs, degrees of freedom, Grubler's criterion, Kinematic chain, mechanism, structure, Mobility of Mechanism, inversion, Machine Inversions of Four bar chain, Single slider crank chain and Double slider crank chain.

06 Hrs

Unit 2: MECHANISMS: Quick return motion mechanisms-whitworth mechanisms, Crank and slotted lever mechanisms. Straight line motion mechanisms-peaucellier's mechanism, engine indicator. Intermittent motion mechanisms- Geneva mechanism and Ratchet and pawl mechanism. Toggle mechanism, Pantograph, Ackerman steering mechanism, Davis steering gear mechanism.

06 Hrs

Unit 3: VELOCITY ANALYSIS OF MECHANISMS: Introduction Absolute and relative motions, vectors, addition and subtraction of vectors, Motion of a link, velocity analysis by relative velocity method, four-link mechanism, slider-crank mechanism, crank and slotted lever mechanism. Instantaneous centre, number of I- centres, Kennedy's theorem, locating I-centres, velocity analysis by I-centre method.

07 Hrs

Unit 4: ACCELERATION ANASYIS OF MECHANISMS: Acceleration, Angular acceleration of links, Acceleration of intermediate and offset points, four bar mechanisms, slider-crank mechanism, Coriolis acceleration component, Crank and slotted lever mechanism, Kliens construction.

07 Hrs

PART – B

Unit 5: GEARS: Classification & application of different types of gears, Spur Gear terminology, law of gearing, gear tooth profiles, Path of contact, Arc of contact, Contact ratio, Interference in involute gears and under cutting. Methods of avoiding interference, Back lash, Comparison of involute and cycloidal tooth profiles.

07 Hrs

Unit 6: GEAR TRAINS: Simple gear trains, Compound gear trains, Epicyclic gear trains, Algebraic and tabular methods of finding velocity ratio of epicyclic gear trains. Tooth load and torque calculations in epicyclic gear trains. **05 Hrs**

Unit 7: BELT, ROPE & CHAIN DRIVES: Belt drives: Introduction, classification, velocity ratio, effect of slip, ratio of belt tensions, effect of centrifugal tension, power transmitted, effect of initial belt tension. V-belts – ratio of belt tensions, power transmitted.

Rope & chain drive: Classification, expression for speed ratio, Power Transmitted, applications. **08 Hrs**

Unit 8: CAMS: Types of cams, types of followers, Follower Motions including SHM, Uniform velocity, uniform acceleration and retardation and Cycloidal motion. Displacement, Velocity and acceleration curves for cam profiles. Disc cam with reciprocating follower having knife-edge, roller and flat –faced follower, Disc cam with oscillating roller follower. **06 Hrs**

TEXT BOOKS :

1. Rattan S.S. “ Theory of Machines” Tata McGraw-Hill Publishing Company Ltd. New Delhi and 2nd edition 2005.
2. Sadhu Singh, “ Theory of Machines”, Person Education(Singapore) Pvt. Ltd., Indian Branch, New Delhi, 2nd Edi.2006.

REFERENCE BOOKS :

1. Shigley. J.V. and Uickers, J. J., “ Theory of Machines & Mechanisms” OXFORD University Press.2004
2. “ Theory of Machines-I”, by Thomas Bevan, CBS Publications, New Delhi.

SCHEME FOR END SEMESTER EXAMINATION:

One question to be set from each unit. Students have to answer any FIVE full questions out of EIGHT questions, choosing at least 2 questions from part A and 2 questions from part B.

FLUID MECHANICS

Sub Code: P08ME45

Hrs/week : 04

Lecturer Hrs: 52

L:T:P: 4:0:0

CIE Marks: 50

Exam Hrs : 03

SEE Marks: 50

PART-A

Unit 1: PROPERTIES OF FLUIDS: Introduction, properties of fluids, viscosity, Newton's law of cooling, thermodynamics properties. Surface tension, capillarity, vapour pressure and cavitation.

06 Hrs

Unit 2: FLUID STATISTICS (WITH BUOYANCY): Fluid pressure at a point, Pascal's law, pressure variation in a static fluid, absolute, gauge, atmospheric & vacuum pressures, simple manometers, differential manometers, Total pressure, & centre of pressure, vertical plane surfaces, inclined plane surfaces and curved surfaces submerged in liquid, Buoyancy, Buoyant force, centre of buoyancy, meta centre and meta centric height (analytical method), stability of submerged and floating bodies.

07 Hrs

Unit 3: FLUID KINEMATICS: Types of Fluid flow, Introduction, continuity equation, continuity equation in three dimensions (Cartesian co-ordinate system only) and velocity and acceleration, velocity potential function and stream function, flow net.

07 Hrs

Unit 4: DIMENSIONAL ANALYSIS: Introduction, derived quantities, Dimensions of physical quantities, dimensional homogeneity-Buckingham's π theorem, the Rayleigh's method, important dimensionless numbers.

06 Hrs

PART-B

Unit 5: FLUID DYNAMICS (FLUID FLOW MEASUREMENTS): General energy and momentum equations, Euler's equation of motion, Bernoulli's equation derived from fundamental & Euler's equation, Bernoulli's equation for real fluids. Fluid Flow measurements: Venturimeter, Orifice meter and Pitot tube.

07 Hrs

Unit 6: LAMINAR FLOW AND VISCOUS EFFECTS: Reynold's number, critical Reynold's number, laminar flow through a round pipe- Hagen Poiseuille's equation, laminar flow between parallel stationary plates.

06 Hrs

Unit 7: FLOW PAST IMMERSED BODIES: Drag, lift, expression for lift and drag, pressure drag and friction drag, boundary layer concept, displacement thickness, momentum thickness and energy thickness. Introduction to compressible flow: Velocity of sound in a fluid, Mach number, propagation of pressure waves in a compressible fluid. **07 Hrs**

Unit 8: FLOW THROUGH PIPES: Frictional losses in pipe flow, Darcy and Chezy equations for loss of head due to friction in pipes, hydraulic gradient & total energy line. Introduction to CFD: General principles and approaches for solving fluid dynamic problems using computers, introduction to CFD software packages. **06 Hrs**

TEXT BOOKS:

1. Fluid Mechanics by Streeter – Mc Graw Hill, 7th ed., 1979
2. A Text Book of fluid mechanics and hydraulic machines by Dr. R.K.Bansal Laxmi publications (p) Ltd., New Delhi. 2000.

REFERENCE BOOKS :

1. Fluid Mechanics and Hydraulics by DR. Jagadish Lal, Metropolitan Book Co. Pvt. Ltd, New Delhi. 1995
2. Fluid Mechanics by Agarwal, Tata McGraw Hill edition.
3. Engineering Fluid Mechanics by Dr.K.L.Kumar,Euroasia Publishing House (P),Ltd, 2005
4. Engineering Fluid Mechanics by Dr.R.J.Garde and Dr.A.J.Mirajgaonkar, Scitech Publications (India)Chennai,2003.
5. Fluid Mechanics by John F.Douglas, Janul and M.Gasiosek and John A. Swaffild,Pearson education Asia ,4th edn ,2002.
6. Fluid Mechanics by White, 5th edn,Tata Mcgraw Hill,2003.

SCHEME FOR END SEMESTER EXAMINATION:

One question to be set from each unit. Students have to answer any FIVE full questions out of EIGHT questions, choosing at least 2 questions from part A and 2 questions from part B.

MANUFACTURING PROCESS – II

Sub Code: ME 46
Hrs/week: 03
Lecturer Hrs: 52

L:T:P: 2:1:0

CIE Marks : 50
Exam Hrs : 03
SEE Marks: 50

PART – A

Unit 1: THEORY OF METAL CUTTING: Single point cutting tool nomenclature, geometry, orthogonal and oblique cutting, mechanism of chip formation, types of chips, Merchant's circle diagram and analysis, Ernst Merchant's solution, shear angle relationship, problems of Merchant's analysis **07 Hrs**

Unit 2: TOOL WEAR: causes and types of tool wear, effects of cutting parameters on tool life, tool failure criteria, Taylor's tool life equation, problems on tool life evaluation. Heat generation in metal cutting, factors affecting heat generation, measurement of tool tip temperature. **06 Hrs**

Unit 3: CUTTING TOOL MATERIALS: Desired properties, types of cutting tool materials – HSS, carbides, coated carbides CBN, PCD and ceramics. Cutting fluids, desired properties, types and selection. Machinability and factors affecting machinability. **06 Hrs**

Unit 4: PRODUCTION LATHES: Introduction, principle and working, part of centre lathe specification different operations, definitions of speed, feed and depth of cut, cutting time calculation, Calculation of change of gears in thread cutting, constructional features of turret and capstan lathes, tool layout. **07 Hrs**

PART – B

Unit 5: SHAPING AND PLANNING MACHINES: Classification, specification, constructional features, driving mechanisms. Shaping and planning operations. Comparison between shaping and planning, Problems on calculation of machining time. **07 Hrs**

Unit 6: DRILLING MACHINES: Classification, Specification, constructional features, drilling & related operations, types of drill & drill bit nomenclature, machining time. **06 Hrs**

Unit 7: MILLING MACHINES: Classification, constructional features, milling cutters nomenclature, mills operations, up milling and down milling concepts. Indexing: Simple, compound, differential indexing calculations. Simple problems on simple and compound indexing. **07 Hrs**

Unit 8: GRINDING MACHINES: Types of abrasives, bonding process, classification, constructional features of cylindrical and surface grinding machines, tool and cutter grinder, specification of grinding wheel, selection of grinding wheel, balancing of grinding wheel. Super Finishing Operations: Lapping, honing and super finishing operations. **06 Hrs**

TEXT BOOKS:

1. Workshop Technology by Hazara Choudhry, Vol-II, Media Promoters & Publishers Pvt. Ltd. 2004
2. Production Technology by R.K.Jain, Khanna Publications, 2003.
3. Production technology by HMT, Tata McGraw Hill, 2001.
4. Modern manufacturing process by Adithan. Tata McGraw Hill, 2002 edn

REFERENCE BOOKS:

1. Manufacturing Science by Amitabha Ghosh and Mallik, affiliated East West Press, 2003.
2. Fundamentals of Metal Machining and Machine Tools by G. Boothroyd, McGraw Hill, 2000.
3. Theory of Metal cutting & practice by A. Bhatta charya.

SCHEME FOR END SEMESTER EXAMINATION:

One question to be set from each unit. Students have to answer any FIVE full questions out of EIGHT questions, choosing at least 2 questions from part A and 2 questions from part B.

METROLOGY & MEASUREMENTS LABORATORY

Sub Code: P08MEL 47
Hrs/week: 03
Lecturer Hrs: 42

L:T:P: 0:0:1.5

CIE Marks : 50
Exam Hrs : 03
SEE Marks : 50

PART – A

1. Calibration of Pressure Gauge
2. Calibration of Thermocouple
3. Calibration of LVDT
4. Calibration of Load cell
5. Determination of modulus of elasticity of a mild steel specimen using strain gauges.

PART – B

6. Introduction to Measuring Instruments & Tools
7. Calibration of a micrometer using slip gauges / Vernier / Dial Gauge.
8. Measurements of angle using Sine Center / Sine bar /Roller set.
9. Measurements of gear tooth profile using gear tooth vernier / gear tooth micrometer
10. Measurements of Screw thread Parameters using two wire or three wire method.
11. Measurements using Optical Projector / Tool maker Microscope.
12. Measurements of alignment using Autocollimator / roller set.
13. Measurements of Surface roughness using Roughness Tester.
14. Measurement using Interferometer & Optical flats.
15. Measurements of cutting tool forces using
 - a) Lathe tool Dynamometer.
 - b) Drill tool Dynamometer.

SCHEME OF EXAMINATION:

One Question from Metrology (Part –A)	:	20 Marks
One Question from Instrumentation (Part – B)	:	20 Marks
Viva – Voice	:	10 Marks

Total 50 Marks

FLUID MACHINERY LABORATORY

Sub Code : P08MEL 48

Hrs/week : 03

Lecturer Hrs : 42

L:T:P: 0:0:1.5

CIE Marks : 50

Exam Hrs : 03

SEE Marks : 50

PART-A

1. Calibration of flow measuring devices:
 - a). Venturimeter
 - b). Orifice plate
2. Calibration of V-notch, for flow through a small channel.
3. Determination of coefficient of friction of flow in a pipe.
4. Determination of minor losses in flow through pipes.

PART- B

5. Performance testing of Turbines-Pelton Wheel, Francis Turbine and Kaplan turbine.
6. Performance testing of Centrifugal pump & Reciprocating Pump.
7. Performance test of a two stage Reciprocating Air Compressor.
8. Performance test on an Air Blower.

SCHEME OF EXAMINATION:

One Question from Part -A	:	15 Marks (05 write up + 10)
One Question from Part – B	:	25 Marks (05 write up + 10)
Viva – Voice	:	10 Marks

Total

50 Marks
