

ACCOUNTING AND FINANCE (PART - I)

Accounting, Auditing and Taxation

Accounting as a financial information system — Impact of behavioral sciences — Methods of accounting of changing price levels with particular reference to current Purchasing Power (CPP) accounting Advanced problems of company accounts — Amalgamation absorption and reconstruction of companies — Accounting of holding companies — Valuation of shares and goodwill. Controllership functions—Property control legal and management.

Important provisions of the Income Tax Act., 1961 — Definition-Charge of Income tax — Exemptions Depreciation and investment allowance-Simple problems of computation of income under the various heads and determination of assessable income — Income tax authorities.

Nature and functions of Cost Accounting — Cost classification-Techniques of segregating semivariable costs into fixed and variable components — job costing — FIFO and weighted average methods or calculating equivalent units of production — Reconciliation of cost and financial accounts — Marginal Costing — Cost-volume-profit relationship; Algebraic formulae and graphical representation-Shut-down point-Techniques of cost control and cost reduction-Budgetary control-flexible Budgets — Standard costing and variance analysis-Responsibility accounting-Bases of charging overheads and their inherent fallacy - Costing for pricing decisions.

Significance of the attest function — Programming the audit-works-Valuation and verification of assets, fixed, wasting and current assets — Verification of liabilities — Audit of limited companies - appointment status, powers, duties and liabilities of the auditor — Auditor's report-Audit of share capital and transfer of shares -Special points in the audit of banking and insurance companies.

Part - I

BUSINESS FINANCE AND FINANCIAL INSTITUTIONS.

Concept and scope of Financial Management Financial goals of corporations — Capital budgeting; Rules of the thumb and Discounted cash flow approaches — Incorporating uncertainty in investment decisions - Designing an optimal capital structure - Weighted average cost of capital and the controversy surrounding the Modigliani and Miller model, Sources - of raising short-term, intermediate and longterm finance — Role of public and convertible debentures — Norms and guidelines regarding debt-equity ratios, — Determinants of an optimal dividend policy — optimising models of James E. Walter and John Lintner — Forms of dividend payment — Structure of working capital and the variable affecting the level of difference of components — Cash flow approach of forecasting working capital needs — Profiles of working capital in Indian industries — Credit management and credit policy — Consideration of tax in relation to financial planning and cash flow statements.

Organisation and deficiencies of Indian Money Market structure of assets and liabilities of commercial

banks — Achievements and failures of nationalisation Regional rural banks Recommendations of the Tandon (P.L.) study group on following of bank credit, 1976 and their revision by the Chore (K.B.) committee, 1979 - An assessment of the monetary and credit policies of the Reserve bank of India — Constituents of the Indian Capital Market — Functions and working of All India term financial institutions (IDBI, IFCI, ICICI and IRCI) — Investment policies of the Life Insurance corporation of India and the Unit Trust of India — Present state of stock exchanges and their regulation.

Provision of the Negotiable Instruments Act, 1881.

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Crossings and endorsements with particular reference to statutory protection to the paying and collecting bankers — Salient Provision of the Banking Regulation Act, 1949 with regard to chartering, supervision and regulation of banks.

PAPER -11

Organisation Theory and Industrial Relations.

Part - I

ORGANISATION THEORY

Nature and concept of Organisation : Organisation goals Primary and secondary goals Single and multiple goals, ends-means chain-Displacement, succession, expansion and multiplication of goals — Formal organisation : Type, Structure — Line and Staff, functional matrix, and project — Informal organisation - functions and limitations.

Evolution of organisation theory : (classical, Neo-classical and system approach-Bureaucracy Nature and basis of power, sources of power, power structure and politics—Organisational behaviour as a dynamic system : technical social and power systems interrelations and interactions — Perception-Status system : Theoretical and empirical foundations of Maslow, Megegore, Herzberg, Likert, Vroom, Porter and Lawler, Odam and Human Models of motivation. Morale and productivity-Leadership; Theories and styles — Management of Conflicts in organisation -- Transactional Analysis — Significance of culture to organisations. Limits of rationality - simon - March approach. Organisational change, adaptation, growth and development—Organisational control and effectiveness.

Part-II

INDUSTRIAL RELATIONS

Nature and scope of industrial relations. Industrial labour in India and its commitment-Theories of unionism—Trade union movement in India—Growth and structure—Role of outside leadership—Workers education and other problems—Collective bargaining—approaches conditions, limitations and its effectiveness in Indian conditions—Workers participation in management : philosophy, rationale, present day state of affairs *and its* future prospects.

Prevention and settlement of industrial disputes in India : preventive measures, settlement machinery and other measures in practice - industrial relations in public enterprises - Absenteeism and labour turn-over in Indian industries — Relative wages and wage differentials : wage policy in India — The Bonus issue — International Labour Organisation and India — Role of personnel department in the organisation — Executive development, personnel policies, personnel audit and personnel research.

19. MATHEMATICS

PAPER-I

Any five questions may be attempted out of 10 questions to be set in the paper. Each questions should carry 40 and should be divided in three/four parts. Every question taken in all parts together must be answerable in 34 to 36 minutes. The syllabus is divided in six topics. At least one question must be set from each topic.

- **Linear Algebra** Vector space, Linear dependence and independence, Subspace, bases, dimension, Finite dimensional vector spaces.

Matrices : Cayley - Hamilton theorem, eigenvalues and Eigen vectors, matrix of transformation, row and column reduction, echelon form, rank, equivalence, congruence and similarity. Reduction to canonical forms. Orthogonal and unitary reduction of quadratic and hermitian forms, positive definite quadratic forms.

- **Calculus** : Real numbers, bounded sets, open and closed sets, real sequences, limits, continuity, differentiability, mean value theorems, Taylor's theorem with remainders, indeterminate forms, maxima and minima, asymptotes, functions of several variables, continuity, differentiability, partial derivatives, maxima and minima, Lagranges methods of multipliers, jacobian, Reimann's definition of definite integrals. Indefinite integrals, infinite & improper integrals, beta & gamma functions, double and tripe integrals (evaluation techniques only), areas, surface and volumes, centre of gravity.

- **Analytic geometry** : Cartesian and polar co-ordinates in two and three dimensions, second degree equations in two and three dimensions, reduction to canonical forms, straight lines, shortest distance between two skew lines, plane, sphere, cone, cylinder, paraboloid, ellipsoid, hyperboloid of one and two sheets and their properties.

- **Ordinary differential equations** Formulation of differential equation, order and degree, equations of first order and first degree, integrating factors, equations of first order but not of first degree, clariaut's equation, singular solutions.

Higher order linear equations with constant coefficients, complementary functions and particular integrals, general solution, Euler-Cauchy equation.

Second order linear equation with variable coefficients, determination of complete solution when one solution is known, method of variation of parameters.

• **Dynamics, Statics and Hydrostatics** : Degree of freedom and constraints, rectilinear motion, simple harmonic motion, motion in a plane projectile, constrained motion, work and energy, conservation of energy, motion under impulsive forces, Kepler's laws, orbit under central forces, motion of varying mass, motion under resistance.

Equilibrium of a system of particles, work and potential energy, friction, common catenary, principle of virtual work, stability of equilibrium, equilibrium of forces in three dimensions.

Pressure of heavy fluids, equilibrium of fluids under a given system of forces, Bernoulli's equation, center of pressure, thrust on curved surfaces, equilibrium of floating bodies, stability of equilibrium, metacenter, pressure of gases.

6. **Vector analysts**: Scalar and vector fields, triple products, differentiation of vector function of scalar variable, gradient, divergence and curl in cartesian, cylindrical and spherical co-ordinates and their physical interpretation. Higher order derivatives, vector identities and vector equations.

Application to geometry : Curves in spaces, curvature and torsion, Serret-Frenet formulae Gauss and Stoke's theorem, Green's identities.

PAPER-II

The paper will be in two sections. Each section will contain eight questions. Candidates will have to answer any five questions selecting at least one from each section. Each section divided in 3/4 parts, carried 60 marks and should be answerable in 34 to 36 minutes.

Section - A: Algebra, Complex Analysis, Operations Research, mathematical Modelling.

Section - B : Partial Differential Equation, Discrete Mathematics, Mechanics and Fluid Dynamics, Probability Theory.

Section - A

1. **Algebra** : Groups, Sub groups, normal subgroups, homomorphism of groups, quotient groups basic isomorphism theorem, Sylow's theorem, permutation groups, Cayley theorem. Rings and ideals, Principal ideal Domains, Unique Factorisation Domains and Euclidean Domains, and Euclidean Domains, field extensions, finite fields.

2. **Complex Analysis** : Analytic function, Cauchy- Riemann equations, Cauchy's theorem, Cauchy's integral formula, power series, Taylor's series, Laurent's series, Singularities, Cauchy Residue Theorem, Contour integration, Conformal mapping, Bilinear transformation.

3. **Operations Research** : Linear programming problems, basic solution, basic feasible solution and optimal solution. Graphical method and simplex method of solution, Duality, Transportation and assignment problems.

Analysis of steady state and transient solution for queueing system with Poisson arrivals and exponential service time.

Deterministic replacement models, sequencing problem with two machines and n jobs, 3 machines and n jobs (special case).

1. Mathematical Modeling

(a) Difference and differential equation growth models : Single species population models, Population growth-age structure model. The spread of technological innovation.

(b) Higher order linear models - A Model for the detection of diabetes.

(c) Nonlinear population growth models : Prey - predator models, Epidemic growth models.

(d) An Application in environment : Urban wastes water management planning models.

(e) Models from political science : Proportional representation (cumulative and comparison voting) models.

Section-B

