SYLLABUS FOR VARIOUS POSTS IN DSIIDC

POST : Financial Controller / Divisional Accounts Officer

Accounting, Taxation and Auditing

1. Financial Accounting : Accounting as a Financial Information System; Impact of Behavioural Sciences. Accounting Standards e.g., Accounting for Depreciation, Inventories, Research and Development Costs, Long-term Construction Contracts, Revenue Recognition, Fixed Assets, Contingencies, Foreign Exchange Transactions, Investments and Government Grants, Cash Flow Statement, Earnings Per Share. Accounting for Share Capital Transactions including Bonus Shares, Right Shares, Employees Stock Option and Buy- Back of Securities. Preparation and Presentation of Company Final Accounts. Amalgamation, Absorption and Reconstruction of Companies.

2. Cost Accounting : Nature and Functions of Cost Accounting. Installation of Cost Accounting System. Cost Concepts related to Income Measurement, Profit Planning, Cost Control and Decision Making.

Methods of Costing: Job Costing, Process Costing, Activity Based Costing. Volume – cost – Profit Relationship as a tool of Profit Planning.

Incremental Analysis/ Differential Costing as a Tool of Pricing Decisions, Product Decisions, Make or Buy Decisions, ShutDown Decisions etc. Techniques of Cost Control and Cost Reduction: Budgeting as a Tool of Planning and Control. Standard Costing and Variance Analysis. Responsibility Accounting and Divisional Performance Measurement.

3. Taxation : Income Tax: Definitions; Basis of Charge; Incomes which do not form Part of Total Income. Simple problems of Computation of Income (of Individuals only) under Various Heads, i.e., Salaries, Income from House Property, Profits and Gains from Business or Profession, Capital Gains, Income from other sources, Income of other Persons included in Assessee's Total Income Set - Off and Carry Forward of Loss.Deductions from Gross Total Income Salient Features / Provisions Related to VAT and Services Tax.

4. Auditing : Company Audit: Audit related to Divisible Profits, Dividends, Special investigations, Tax audit. Audit of Banking, Insurance, Non-Profit Organizations and Charitable Societies/ Trusts/Organizations.

Financial Management, Financial Institutions and Markets

1. Financial Management : Finance Function: Nature, Scope and Objectives of Financial Management: Risk and Return Relationship.

Tools of Financial Analysis: Ratio Analysis, Funds-Flow and Cash-Flow Statement.

Capital Budgeting Decisions: Process, Procedures and Appraisal Methods. Risk and Uncertainty Analysis and Methods.

Cost of capital: Concept, Computation of Specific Costs and Weighted Average Cost of Capital. CAPM as a Tool of Determining Cost of Equity Capital.

Financing Decisions: Theories of Capital Structure - Net Income (NI) Approach, Net Operating Income (NOI) Approach, MM Approach and Traditional Approach. Designing of Capital structure: Types of Leverages (Operating, Financial and Combined) EBIT- EPS Analysis, and other Factors.

Dividend Decisions and Valuation of Firm: Walter 's Model , MM Thesis, Gordan's Model Lintner's Model. Factors Affecting Dividend Policy. Working Capital Management: Planning of Working Capital. Determinants of Working Capital. Components of Working Capital - Cash, Inventory and Receivables. Corporate Restructuring with focus on Mergers and Acquisitions (Financial aspects only)

2. Financial Markets and Institutions : Indian Financial System: An Overview Money Markets: Participants, Structure and Instruments. Commercial Banks. Reforms in Banking sector. Monetary and Credit Policy of RBI. RBI as a Regulator.

Capital Market: Primary and Secondary Market. Financial Market Instruments and Innovative Debt Instruments; SEBI as a Regulator.

Financial Services: Mutual Funds, Venture Capital, Credit Rating Agencies, Insurance and IRDA.

POST : Divisional Manager / Sr. Manager

1. Managerial Function and Process: Concept and Foundations of Management, Evolution of Management Thoughts; Managerial Functions – Planning, Organizing, Controlling; Decision making; Role of Manager, Managerial skills; Entrepreneurship; Management of innovation; Managing in a global environment, Flexible Systems Management; Social responsibility and managerial ethics; Process and customer orientation; Managerial processes on direct and indirect value chain.

2. Organizational Behavior and Design: Conceptual model of organization behavior; The individual processes – personality, values and attitude, perception, motivation, learning and reinforcement, work stress and stress management; The dynamics of organization behavior – power and politics, conflict and negotiation, leadership process and styles, communication; The Organizational Processes - decision making, job design; Classical, Neoclassical and Contingency approaches to organizational design; Organizational theory and design - organizational culture, managing cultural diversity, learning organization; organizational change and development; Knowledge Based Enterprise – systems and processes; Networked and virtual organizations.

3. Human Resource Management: HR challenges; HRM functions; The future challenges of HRM; Strategic Management of human resources; Human resource planning; Job analysis; Job evaluation; Recruitment and selection; Training and development; Promotion and transfer; Performance management; Compensation

management and benefits; Employee morale and productivity; Management of organizational climate and Industrial relations; Human resources accounting and audit; Human resource information system; International human resource management.

4. Accounting for Managers: Financial accounting – concept, importance and scope, generally accepted accounting principles, preparation of financial statements with special reference to analysis of a balance sheet and measurement of business income, inventory valuation and depreciation, financial statement analysis, fund flow analysis, the statement of cash flows; Management accounting – concept, need, importance and scope; Cost accounting – records and processes, cost ledger and control accounts, reconciliation and integration between financial and cost accounts; Overhead cost and control, Job and process costing, Budget and budgetary control, Performance budgeting, Zero-base budgeting, relevant costing and costing for decision-making, standard costing and variance analysis, marginal costing and absorption costing.

5. Financial Management: Goals of finance function; Concepts of value and return; Valuation of bonds and shares; Management of working capital: Estimation and financing; Management of cash, receivables, inventory and current liabilities; Cost of capital; Capital budgeting; Financial and operating leverage; Design of capital structure: theories and practices; Shareholder value creation: dividend policy, corporate financial policy and strategy, management of corporate distress and restructuring strategy; Capital and money markets: institutions and instruments; Leasing, hire purchase and venture capital; Regulation of capital market; Risk and return: portfolio theory; CAPM; APT; Financial derivatives: option, futures, swap; Recent reforms in financial sector.

6. Marketing Management: Concept, evolution and scope; Marketing strategy formulation and components of marketing plan; Segmenting and targeting the market; Positioning and differentiating the market offering; Analyzing competition; Analyzing consumer markets; Industrial buyer behavior; Market research; Product strategy; Pricing strategies; Designing and managing Marketing channels; Integrated marketing communications; Building customer satisfaction, Value and retention; Services and non-profit marketing; Ethics in marketing; Consumer protection; Internet marketing; Retail management; Customer relationship management; Concept of holistic marketing.

7. Quantitative Techniques in Decision Making: Descriptive statistics – tabular, graphical and numerical methods, introduction to probability, discrete and continuous probability distributions, inferential statistics sampling distributions, central limit theorem, hypothesis testing for differences between means and proportions, inference about population variances, Chi-square and ANOVA, simple correlation and regression, time series and forecasting, decision theory, index numbers; Linear programming – problem formulation, simplex method and graphical solution, sensitivity analysis.

8. Production and Operations Management: Fundamentals of operations management; Organizing for production; Aggregate production planning, capacity planning, plant design: process planning, plant size and scale of operations, Management of facilities; Line balancing; Equipment replacement and maintenance; Production control; Supply chain management - vendor evaluation and audit; Quality management; Statistical process control, Six Sigma; Flexibility and agility in manufacturing systems; World class manufacturing; Project management concepts, R&D management, Management of service operations; Role and importance of

materials management, value analysis, make or buy decision; Inventory control, MRP; Waste management.

9. Management Information System: Conceptual foundations of information systems; Information theory; Information resource management; Types of information systems; Systems development - Overview of systems and design; System development management life-cycle, Designing for online and distributed environments; Implementation and control of project; Trends in information technology; Managing data resources - Organizing data; DSS and RDBMS; Enterprise Resource Planning (ERP), Expert systems, e-Business architecture, e-Governance; Information systems planning, Flexibility in information systems; User involvement; Evaluation of information systems.

10. Government Business Interface: State participation in business, Interaction between Government, Business and different Chambers of Commerce and Industry in India; Government's policy with regard to Small Scale Industries; Government clearances for establishing a new enterprise; Public Distribution System; Government control over price and distribution; Consumer Protection Act (CPA) and The Role of voluntary organizations in protecting consumers' rights; New Industrial Policy of the Government: liberalization, deregulation and privatization; Indian planning system; Government policy concerning development of Backward areas/regions; The Responsibilities of the business as well as the Government to protect the environment; Corporate Governance; Cyber Laws.

11. Strategic Management: Business policy as a field of study; Nature and scope of strategic management, Strategic intent, vision, objectives and policies; Process of strategic planning and implementation; Environmental analysis and internal analysis; SWOT analysis; Tools and techniques for strategic analysis - Impact matrix: The experience curve, BCG matrix, GEC mode, Industry analysis, Concept of value chain; Strategic profile of a firm; Framework for analyzing competition; Competitive advantage of a firm; Generic competitive strategies; Growth strategies – expansion, integration and diversification; Concept of core competence, Strategic flexibility; Reinventing strategy; Strategy and structure; Chief Executive and Board; Turnaround management; Management of strategic change; Strategic alliances, Mergers and Acquisitions; Strategy and corporate evolution in the Indian context.

12. International Business: International Business Environment: Changing composition of trade in goods and services; India's Foreign Trade: Policy and trends; Financing of International trade; Regional Economic Cooperation; FTAs; Internationalization of service firms; International production; Operation Management in International companies; International Taxation; Global competitiveness and technological developments; Global e-Business; Designing global organizational structure and control; Multicultural management; Global business strategy; Global marketing strategies; Export Management; Export- Import procedures; Joint Ventures; Foreign Investment: Foreign direct investment and foreign portfolio investment; Cross-border Mergers and Acquisitions; Foreign Exchange Risk Exposure Management; World Financial Markets and International Banking; External Debt Management; Country Risk Analysis.

POST : Sr. Project Manager (Civil)

1. BUILDING MATERIALS

Timber: Different types and species of structural timber, density-moisture relationship, strength in different directions, defects, influence of defects on permissible stress, preservation, dry and wet rots, codal provisions for design, Plywood. Bricks: Types, Indian Standard classification, absorption, saturation factor, strength in masonry, influence of morter strength on masonry strength. Cement: Compounds of, different types, setting times, strength. Cement Mortar: Ingredients, proportions, water demand, mortars for plastering and masonry. Concrete: Importance of W/C Ratio, Strength, ingredients including admixtures, workability, testing for strength, elasticity, non-destructive testing, mix design methods.

2. SOLID MECHANICS

Elastic constants, stress, plane stress, Mohr's circle of stress, strains, plane strain, Mohr's circle of strain, combined stress; Elastic theories of failure; Simple bending, shear; Torsion of circular and rectangular sections and simple members.

3. STRUCTURAL ANALYSIS

Analysis of determinate structures - different methods including graphical methods.Analysis of indeterminate skeletal frames - moment distribution, slope-deflection, stiffness and force methods, energy methods, Muller-Breslau principle and application.Plastic analysis of indeterminate beams and simple frames - shape factors.

4. DESIGN OF STEEL STRUCTURES

Principles of working stress method. Design of connections, simple members, Built-up sections and frames, Design of Industrial roofs. Principles of ultimate load design. Design of simple members and frames.

5. DESIGN OF CONCRETE AND MASONRY STRUCTURES

Limit state design for bending, shear, axial compression and combined forces. Codal provisions for slabs, beams, walls and footings. Working stress method of design of R.C. members. Principles of prestressed concrete design, materials, methods of prestressing, losses. Design of simple members and determinate structures. Introductions to prestressing of indeterminate structures.Design of brick masonry as per I.S. Codes.

6. CONSTRUCTION PRACTICE, PLANNING AND MANAGEMENT

Concreting Equipment: Weight Batcher, Mixer, vibrator, batching plant, concrete pump. Cranes, hoists, lifting equipment. Earthwork Equipment:Power shovel, hoe, dozer, dumper, trailers and tractor, rollers, sheep foot rollers, pumps. Construction, Planning and Management: Bar chart, linked bar chart, work-break down structures, Activity - on - arrow diagrams. Critical path, probabilistic Activity durations; Event-based networks. PERT network: Time-cost study, crashing; Resource allocation.

7 A. FLUID MECHANICS, OPEN CHANNEL FLOW, PIPE FLOW

Fluid Properties, Pressure, Thrust, Buoyancy; Flow Kinematics; Integration of flow equations; Flow measurement; Relative motion; Moment of momentum; Viscosity, Boundary layer and Control, Drag, Lift; dimensional Analysis, Modelling; Cavitation; Flow oscillations; Momentum and Energy principles in Open channel flow, Flow controls, Hydraulic jump, Flow sections and properties; Normal flow, Gradually varied flow; Surges; Flow development and losses in pipe flows, Measurements; Siphons; Surges and Water hammer; Delivery of Power Pipe networks.

7 B. HYDRAULIC MACHINES AND HYDROPOWER

Centrifugal pumps, types, performance parameters, scaling, pumps in parallel; Reciprocating pumps, air vessels, performance parameters; Hydraulic ram; Hydraulic turbines, types, performance parameters, controls, choice; Power house, classification and layout, storage, pondage, control of supply**.**

8 A. HYDROLOGY

Hydrological cycle, precipitation and related data analyses, PMP, unit and synthetic hydrographs; Evaporation and transpiration; Floods and their management, PMF; Streams and their gauging; River morphology; Routing of floods; Capacity of Reservoirs.

8 B. WATER RESOURCES ENGINEERING

Water resources of the globe: Multipurpose uses of Water: Soil-Plant-Water relationships, irrigation systems, water demand assessment; Storages and their yields, ground water yield and well hydraulics; Waterlogging, drainage design; Irrigation revenue; Design of rigid boundary canals, Lacey's and Tractive force concepts in canal design, lining of canals; Sediment transport in canals; Non-Overflow and overflow sections of gravity dams and their design, Energy dissipators and tailwater rating; Design of headworks, distribution works, falls, cross-drainage works, outlets; River training.

9. ENVIRONMENTAL ENGINEERING

9 A. WATER SUPPLY ENGINEERING

Sources of supply, yields, design of intakes and conductors; Estimation of demand; Water quality standards; Control of Water-borne diseases; Primary and secondary treatment, detailing and maintenance of treatment units; Conveyance and distribution systems of treated water, leakages and control; Rural water supply; Institutional and industrial water supply.

9 B. WASTE WATER ENGINEERING

Urban rain water disposal; Systems of sewage collection and disposal; Design of sewers and sewerage systems; pumping; Characteristics of sewage and its treatment,

Disposal of products of sewage treatment, streamflow rejuvenation Institutional and industrial sewage management; Plumbing Systems; Rural and semi-urban sanitation.

9 C. SOLID WASTE MANAGEMENT

Sources, classification, collection and disposal; Design and Management of landfills.

9 D. AIR AND NOISE POLLUTION AND ECOLOGY

Sources and effects of air pollution, monitoring of air pollution; Noise pollution and standards; Ecological chain and balance, Environmental assessment.

10 A. SOIL MECHANICS

Properties of soils, classification and interrelationship; Compaction behaviour, methods of compaction and their choice; Permeability and seepage, flow nets, Inverted filters; Compressibility and consolidation; Shearing resistance, stresses and failure; soil testing in laboratory and in-situ; Stress path and applications; Earth pressure theories, stress distribution in soil; soil exploration, samplers, load tests, penetration tests.

10 B. FOUNDATION ENGINEERING

Types of foundations, Selection criteria, bearing capacity, settlement, laboratory and field tests; Types of piles and their design and layout, Foundations on expansive soils, swelling and its prevention, foundation on swelling soils.

11 A. SURVEYING

Classification of surveys, scales, accuracy; Measurement of distances - direct and indirect methods; optical and electronic devices; Measurement of directions, prismatic compass, local attraction; Theodolites - types; Measurement of elevations - Spirit and trigonometric levelling; Relief representation; Contours; Digital elevation modelling concept; Establishment of control by triangulations and traversing - measurements and adjustment of observations, computation of coordinates; Field astronomy, Concept of global positioning system; Map preparation by plane tabling and by photogrammetry; Remote sensing concepts, map substitutes.

11 B. TRANSPORTATION ENGINEERING

Planning of highway systems, alignment and geometric design, horizontal and vertical curves, grade separation; Materials and construction methods for different surfaces and maintenance: Principles of pavement design; Drainage.Traffic surveys, Intersections, signalling: Mass transit systems, accessibility, networking.Tunnelling, alignment, methods of construction, disposal of muck, drainage, lighting and ventilation, traffic control, emergency management.Planning of railway systems, terminology and designs, relating to gauge, track, controls, transits, rolling stock, tractive power and track modernisation; Maintenance; Appurtenant works; Containerisation.

Harbours - layouts, shipping lanes, anchoring, location identification; Littoral transport with erosion and deposition; sounding methods; Dry and Wet docks, components and operational Tidal data and analyses.

Airports - layout and orientation; Runway and taxiway design and drainage management; Zoning laws; Visual aids and air traffic control; Helipads, hangers, service equipment

POST : Sr. Project Manager (Electrical)

1. Circuit Theory:

Circuit components; network graphs; KCL, KVL; circuit analysis methods: nodal analysis, mesh analysis; basic network theorems and applications; transient analysis: RL, RC and RLC circuits; sinusoidal steady state analysis; resonant circuits; coupled circuits; balanced 3-phase circuits; Two-port networks.

2. Signals & Systems:

Representation of continuous – time and discrete-time signals & systems; LTI systems; convolution; impulse response; time - domain analysis of LTI systems based on convolution and differential/difference equations. Fourier transform, Laplace transform, Z-transform, Transfer function. Sampling and recovery of signals DFT, FFT Processing of analog signals through discrete-time systems.

3. E.M. Theory:

Maxwell's equations, wave propagation in bounded media. Boundary conditions, reflection and refraction of plane waves. Transmission line: travelling and standing waves, impedance matching, Smith chart.

4. Analog Electronics:

Characteristics and equivalent circuits (large and small-signal) of Diode, BJT, JFET and MOSFET. Diode circuits: clipping, clamping, rectifier. Biasing and bias stability. FET amplifiers. Current mirror; Amplifiers: single and multi-stage, differential, operational, feedback and power. Analysis of amplifiers; frequency-response of amplifiers. OPAMP circuits. Filters; sinusoidal oscillators: criterion for oscillation; single-transistor and OPAMP configurations. Function generators and wave-shaping circuits. Linear and switching power supplies.

5. Digital Electronics:

Boolean algebra; minimization of Boolean functions; logic gates; digital IC families (DTL, TTL, ECL, MOS, CMOS). Combinational circuits: arithmetic circuits, code converters, multiplexers and decoders. Sequential circuits: latches and flip-flops, counters and shift-registers. Comparators, timers, multivibrators. Sample and hold circuits, ADCs and DACs. Semiconductor memories. Logic implementation using programmable devices (ROM, PLA, FPGA).

6. Energy Conversion:

Principles of electromechanical energy conversion: Torque and emf in rotating machines. DC machines: characteristics and performance analysis; starting and

speed control of motors; Transformers: principles of operation and analysis; regulation, efficiency; 3-phase transformers. 3-phase induction machines and synchronous machines: characteristics and preformance analysis; speed control.

7. Power Electronics and Electric Drives:

Semiconductor power devices: diode, transistor, thyristor, triac, GTO and MOSFET–static characteristics and principles of operation; triggering circuits; phase control rectifiers; bridge converters: fully-controlled and half-controlled; principles of thyristor choppers and inverters; DC-DC converters; Switch mode inverter; basic concepts of speed control of dc and ac motor drives applications of variable-speed drives.

8. Analog Communication:

Random variables: continuous, discrete; probability, probability functions. Statistical averages; probability models; Random signals and noise: white noise, noise equivalent bandwidth; signal transmission with noise; signal to noise ratio. Linear CW modulation: Amplitude modulation: DSB, DSB-SC and SSB. Modulators and Demodulators; Phase and Frequency modulation: PM & FM signals; narrowband FM; generation & detection of FM and PM, Deemphasis, Preemphasis. CW modulation system: Superhetrodyne receivers, AM receivers, communication receivers, FM receivers, phase locked loop, SSB receiver Signal to noise ratio calculation for AM and FM receivers.

9. Control Systems:

Elements of control systems; block-diagram representation; open-loop & closed-loop systems; principles and applications of feed-back. Control system components. LTI systems: time-domain and transform-domain analysis. Stability: Routh Hurwitz criterion, root-loci, Bode-plots and polar plots, Nyquist's criterion; Design of lead-lad compensators. Proportional, PI, PID controllers. State-variable representation and analysis of control systems.

10. Microprocessors and Microcomputers:

PC organization; CPU, instruction set, register set, timing diagram, programming, interrupts, memory interfacing, I/O interfacing, programmable peripheral devices.

11. Measurement and Instrumentation:

Error analysis; measurement of current, voltage, power, energy, power-factor, resistance, inductance, capacitance and frequency; bridge measurement. Signal conditioning circuit; Electronic measuring instruments: multimeter, CRO, digital voltmeter, frequency counter, Q-meter, spectrum-analyzer, distortion-meter. Transducers: thermocouple, thermostat, LVDT, strain-gauge, piezo-electric crystal.

12. Power Systems: Analysis and Control:

Steady-state performance of overhead transmission lines and cables; principles of active and reactive power transfer and distribution; per-unit quantities; bus admittance and impedance matrices; load flow; voltage control and power factor correction; economic operation; symmetrical components, analysis of symmetrical and unsymmetrical faults. Concept of system stability: swing curves and equal area criterion. Static VAR system. Basic concepts of HVDC transmission.

13. Power System Protection:

Principles of over current, differential and distance protection. Concept of solid state relays. Circuit breakers. Computer aided protection: Introduction; line bus, generator, transformer protection; numeric relays and application of DSP to protection.

14. Digital Communication:

Pulse code modulation (PCM), differential pulse code modulation (DPCM), delta modulation (DM), Digital modulation and demodulation schemes: amplitude, phase and frequency keying schemes (ASK, PSK, FSK). Error control coding: error detection and correction, linear block codes, convolution codes. Information measure and source coding. Data networks, 7-layer architecture.

S. No	Name of the post	Total Marks	Description of questions
1.	Divisional Manager	200	Objective Paper : 100 questions on General Awareness, Reasoning, Numerical Ability, Computer Literacy, English Language; & Descriptive Paper : 100 marks (Test in English language comprising of Essay, Precis and comprehension & professional knowledge in the relevant discipline)
2.	Sr. Project Manager (Electrical)	200	Objective Paper : 100 questions on General Awareness, Reasoning, Numerical Ability, Computer Literacy, English Language; & Descriptive Paper : 100 marks (to assess technical & professional knowledge in the relevant discipline
3.	Sr. Project Manager (Civil)	200	Objective Paper : 100 questions on General Awareness, Reasoning, Numerical Ability, Computer Literacy, English Language; & Descriptive Paper : 100 marks (to assess technical & professional knowledge in the relevant discipline
4.	Divisional Account Officer	200	Objective Paper : 100 questions on General Awareness, Reasoning, Numerical Ability, Computer Literacy, English Language; & Descriptive Paper : 100 marks (to assess technical & professional knowledge in the relevant discipline
5.	Sr. Manager	200	Objective Paper : 100 questions on General Awareness, Reasoning, Numerical Ability, Computer Literacy, English Language; & Descriptive Paper : 100 marks (Test in English language comprising of Essay, Precis and comprehension & professional knowledge in the relevant discipline)