

TAMIL NADU PUBLIC SERVICE COMMISSION

Syllabus for the post of Assistant General Manager (Projects) Infrastructure in the Tamil Nadu Industrial Development Corporation Limited (TIDCO)

Single Paper consisting of Engineering (UG Degree Standard) and Business Administration (PG Degree Standard)

Code: 474

UNIT-I: ENGINEERING PHYSICS AND CHEMISTRY (20 Questions)

Mechanics: Newton's laws of motion – gravitation – work, energy and power – Properties of matter: Elasticity – moduli of elasticity – Sound: intensity level – reverberation – Ultrasonics : production, detection and applications – Quantum Physics : Photoelectric effect – dual nature of matter and radiation – Heisenberg's uncertainty principle – Schrödinger's wave equation.

Water – Sources – Classifications – Softening process – Desalination – RO Method – Internal treatment – Treatment of Water for Municipal purposes. Plastics – High polymer – classification – Polymerization techniques – Thermoplastics – Thermosetting resins – examples. Rubber –Types of Rubber – Vulcanisation – Properties – Unvulcanised and Vulcanised. Natural Rubber – Synthetic Rubber – examples. Refractories – Classification – Manufacture of Refractories – Magnesite – Silica – Zirconia – Chromite. Abrasives – Natural – Artificial–Abrasive paper & cloth. Corrosion: Dry and Wet corrosion – Factors affecting corrosion – Different types of corrosion. Productive coating – Hot dipping– metal cladding, electro deposition – Organic Coatings – Paints – Varnishes. Cement and lime – setting and hardening.

UNIT-II: ENVIRONMENTAL SCIENCE AND ENGINEERING (20 Questions)

Environmental Pollution: Causes, Effects and Preventive measures of Water, Soil, Air and Noise Pollutions. Solid, Hazardous and E-Waste management. Sustainability and management – Development, GDP. Sustainability – concept, needs and challenges – economic, social and aspects of sustainability–from unsustainability to sustainability – millennium development goals, and protocols – Sustainable Development Goals – targets, indicators and intervention areas. Climate change – Global, Regional and local environmental issues and possible solutions. Concept of Carbon Credit – Carbon Footprint. Environmental management in industry – Material Life cycle assessment, Environmental Impact Assessment. Sustainable habitat: Energy efficiency, Sustainable transports. Sustainable energy: Non-conventional Sources, Energy Cycles, carbon cycle, emission and sequestration: Sustainable urbanization – Socio-economical and technological change.

UNIT-III: CIVIL ENGINEERING (20 Questions)

Properties and Classification of cement, lime, bricks, stone and timber – Uses and Tests – materials for acoustics and insulation – Simple stress and strain – elastic constants – relationship – stress and strain in two dimensions, compound stresses– principal stresses – Bending moments and shear forces in statically determinate beams– simple bending theory – Green Building Concept – Types of concrete – testing of fresh and hardened concrete – mix design – quality control – special concreting techniques – concreting equipment – centering and shuttering – slip and moving forms – construction joints – Design of tension and compression members, beams and beam-columns, column bases – Design of bolted and welded connections – Construction management – Construction planning and scheduling – preparation of different types of schedules – methods of scheduling – resource planning – Construction Contracts – Types of estimates – Detailed estimates for different types of buildings – methods of valuation – depreciation – fixation of rent– rate analysis– Quantity estimation.

UNIT-IV: TOWN / URBAN PLANNING (20 Questions)

Planning System in India, Regional Plan, Master Plan, Structure Plan, Detailed Development Plans, City Corporate Plan and Smart City Plan – Principles of Planning – Type of planning surveys, data identification for various plan preparation – Urban infrastructure – Water Supply, Sewage / Drainage services, Solid Waste Management, Roads and Street Lighting – Basics of Remote Sensing and GIS – Classification of spatial and non-spatial data, application of spatial data in urban and regional planning – Concepts of sustainable urban development, sustainable transportation – Land Pooling concept, Transfer of Development Right, Formulation of Re-development and Urban Expansion Plans – Local Area Plans, Town Planning Schemes – Special Economic Zone, Industrial Corridor, Coastal Zone Management Plan.

UNIT-V: ARCHITECTURE, BUILDING SYSTEMS AND SERVICES (20 Questions)

Elements of Architecture – Form, Space, light, colour etc., Principles of Architecture – Proportion, Scale, balance, rhythm, symmetry, hierarchy, pattern and axis. Understanding of organization of form and space, volumetric study, architectural characteristics & style of buildings with examples. Understanding user circulation and spatial requirement for all types of buildings. Universal design principles and Barrier free environment. Computer application in Architecture – Architectural graphics – Drawing & visualization tools – image editing, 2D & 3D modelling, 3D visualization. Water harvesting system, storm water drainage system, solid waste management, building management system, lighting, Air-conditioning, Vertical transportation system, fire safety and firefighting systems.

UNIT-VI: PROJECT MANAGEMENT (20 Questions)

Types of Project – Project Life Cycle – Project Planning– Feasibility Analysis– Project Proposal – Project Designing and Design Review – Project Scheduling Techniques – PERT–CPM – Resource Allocation and Management – Cost and Quality Control – Project implementation – Contracts –Types of Contracts – Partnering Private Public Partnership (PPP) and Innovative Concepts and Practices in Project Management – Project Reporting and Evaluations – Legal Implications of Contracting and Partnering – Project uncertainty and Risk Management – GANTT Chart – Expediting a project.

UNIT-VII: MANAGERIAL ECONOMICS (20 Questions)

Nature and Scope of Managerial Economics – Role of Economic Analysis in Managerial Decision – Demand Analysis of Estimation – Determination of Demand – Demand Forecasting – Forecasting Techniques – Supply and Demand analysis – Long and Short Run Production Functions – Long and Short Cost Functions – Pricing Strategies – Price Discriminations – Concept of Profit – Profit Planning and Control Cost Volume Analysis – Macro Economic Indicators – Macro Economic Aggregate – National Income and Economic Welfare – Multiplier Effect – Fiscal Policy – Economic Indicator and Business Decision Making – Business Strategy Development – Market Structure.

UNIT-VIII: OPERATIONS AND FACILITY MANAGEMENT (20 Questions)

Operations Management – Objectives and Types – Characteristics of Modern Operation Management – Operation Strategy – Supply Chain Management – Warehousing and Supply Chain Strategies – Supply Chain Dynamics – Operation Planning – Work Measurements and Productivity –Total Productive Maintenance – Materials Management and Purchase Management – Total Quality Management(TQM) – Concept – Quality Standards and Certification – Quality Assurance. Facility Management as Business Function – Facility Planning and Budgeting – Space Forecasting and Planning – Space Management Lease Administrations and Property Management – Facility Security Planning and Implementation.

UNIT-IX: PROJECT INFORMATION SYSTEM (20 Questions)

Role of MIS in Decision Making – Enterprise Resource Planning (ERP)– e-Tender (e-Procurement) – Tamil Nadu Transparency in Tender Rules Act 1998 – e-Commerce Concept and Models – B2B, B2C – Cyber Security and Data Privacy– Patents – e-Auditing of Project.

UNIT-X: PROJECT FINANCIAL MANAGEMENT (20 Questions)

Financial Statements – Elements of Costs – Methods and types of Costing – ABC Costing – Marginal Costing and CVP Analysis – Standard Costing – Modern techniques of Performance Measurement – Financial Statement Analysis – Ratio Analysis – Cash Flow and Fund Flow Analysis – Working Capital Management – Capital Budgeting – Risk and Uncertainty in decision making – Inflation adjusted Capital Budgeting.

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