TAMIL NADU PUBLIC SERVICE COMMISSION

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

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

Code: 475

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: BASICS OF COMPUTER ENGINEERING (20 Questions)

Computer Organization – CPU and Microprocessor [ALU, Control Unit and Bus Structure]–Data Storage [Primary, Secondary and Virtual] – Input and Output Devices. System Software – Assembler – Compiler – Loader – Linker – Operating Systems. Programming Languages – Classification of Programming Language, Algorithm, Flow chart, Pseudo code, High-Level Languages – Fundamental concepts of C Programming. Basic Computer Networking – Network Components [Routers, Bridges, Gateways] – ISO–OSI Reference Model – LAN – WAN – Client–Server Architecture – Internet – World Wide Web. Applications – Office Tools – Word processor – Spreadsheet – Power point – Introduction to Database concepts – E–mail – Browser. IT Enabled Services –E–Governance – Multimedia.

UNIT–III: BASICS OF CIVIL AND MECHANICAL ENGINEERING (20 Questions)

Introduction to Engineering mechanics – Units and Dimensions – Laws of Mechanics – Coplanar Forces – Static Equilibrium of Rigid body – Moment of force – free body diagram – friction–laws of friction – sliding friction – wedge friction – Rolling resistance – Lader friction– Friction in screws – Screw jack – Belt friction – Properties of surfaces and solids – Centroids and centre of mass – line and areas – Rectangular, circular, triangular areas by integration – T–section, I–Section, Angle section, Hollow section – Area moment of inertia of plane areas – Parallel axis theorem – Perpendicular axis theorem, Polar moment of Inertia, Principle moment of Inertia, Mass moment of inertia – Centroid of simple solids – Dynamics of particle – Displacement, velocity and acceleration – Different types of motion – Rectilinear, Curvilinear and Projectile motions.

UNIT–IV: BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING (20 Questions)

Ohm's law – Kirchoff's laws – Introduction to DC and AC circuits – single phase and three phase circuits – Power and Power factor, Unbalanced and Balanced loads, Operating principles of moving coil and moving iron instruments (voltmeters and ammeters) – wattmeters, multimeter, energy meters and megger, Construction and principle of operation: DC motors – DC generators –Transformers – Induction motors, Characteristics of PN junction diode – zener diode – half wave and full wave rectifiers – Bipolar junction transistor (CC,CE,CB configurations), SCR, Amplifiers–Operational amplifiers – Inverting and Non–inverting amplifiers, Binary number system – logic gates –Boolean algebra – Half and full adders – Flip–flops–registers and counters –A/D and D/A conversion, Types of analog and digital signals – Modulation and Demodulation (amplitude and frequency). Communication systems: Radio – TV – Fax – Microwave – Satellite and optical fibre.

UNIT–V: 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: Green materials, Energy efficiency, Sustainable transports. Sustainable energy: Non–conventional Sources, energy cycles, carbon cycle, emission and sequestration. Green Engineering: Sustainable urbanization– Socio–economical and technological change.

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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