

PATTERN OF ENTRANCE EXAMINATION - 2011

For M.TECH. PROGRAMMES

The questions will be set at the corresponding degree level.

The questions will be of scholastic aptitude type.

The question paper consists of 100 questions with duration of 150 mts.

Each correct answer carries 3 marks and each wrong answer carries negative mark of 1.

SYLLABUS

Civil (Code 01)

Mathematics

(i) Vector calculus (ii) Determinants and Matrices (iii) Analytic function theory (iv) Calculus and ordinary Differential Equations (v) Numerical Methods (vi) Probability and Statistics.

Other Topics

(i) Mechanics of Solids and Structural Analysis (ii) Concrete and Steel Structure (iii) Soil Mechanics and Geo Technical Engineering (iv) Fluid Mechanics and Water Resources Engineering (v) Environmental Engineering (vi) Surveying (vii) Transportation Engineering (viii) Remote Sensing (ix) Geographic Information Systems (GIS).

Mechanical (Code 02)

Mathematics

(i) Vector calculus (ii) Determinants and Matrices (iii) Analytic function theory (iv) Calculus and ordinary Differential Equations (v) Numerical Methods (vi) Probability and Statistics.

Other Topics

(i) Mechanics and Machine Design (ii) Material Science and Metallurgy (iii) Thermo dynamics (iv) Refrigeration and Air Conditioning (v) Production Technology (vi) Automotive Engines (vii) Automotive Transmission (viii) Strength of Materials (ix) Casting, metal forming and metal joining processes (x) Tool Engineering, Machine tool operation, Metrology and inspection (xi) Engineering Materials, Processing of Plastics and Computer Aided Manufacturing (xii) Product Design, Process Planning, Cost Estimate, Design of Jigs and Fixtures and Press Tools (xiii) Operations Research. (xiv) Operations Management (xv) Quality Control Reliability and Maintenance.

Electrical (Code 03)

Mathematics

(i) Vector calculus (ii) Determinants and Matrices (iii) Analytic function theory (iv) Calculus and ordinary Differential Equations (v) Numerical Methods (vi) Probability and Statistics.

Other Topics

(i) Circuit Theory (ii) Network Analysis and Synthesis (iii) DC & AC Machines (iv) Electronic Circuits (v) Power Electronics (vi) Control Systems (vii) Power System Analysis (viii) Microprocessors.

Electronics (Code 04)**Mathematics**

(i) Vector calculus (ii) Determinants and Matrices (iii) Analytic function theory (iv) Calculus and ordinary Differential Equations (v) Numerical Methods (vi) Probability and Statistics.

Other Topics

(i) Networks (ii) Electronic Devices (iii) Analog Circuits (iv) Digital circuits and microprocessors (v) Signals and Systems (vi) Control Systems (vii) Communications (viii) Electromagnetics

Instrumentation (Code 05)**Mathematics**

(i) Vector calculus (ii) Determinants and Matrices (iii) Analytic function theory (iv) Calculus and ordinary Differential Equations (v) Numerical Methods (vi) Probability and Statistics.

Other Topics

(i) Electron Devices (ii) Linear and Digital Integrated Circuits (iii) Electronic circuits (vi) Transducers and Industrial Instrumentation (v) Microprocessors and Microcontrollers (vi) Network Analysis (vii) Control systems (viii) Biomedical Instrumentation (ix) Electrical and Electronic measurements and instrumentation (x) Process control.

Computer Science (Code 06)**Mathematics**

(i) Vector calculus (ii) Determinants and Matrices (iii) Analytic function theory (iv) Calculus and ordinary Differential Equations (v) Numerical Methods (vi) Probability and Statistics.

Other Topics

(i) Discrete Mathematical Structures (ii) Micro Processor and Hardware Systems (iii) Computer Organization and Architecture (iv) System Programming including Assemblers, Compilers and Operating Systems (v) Programming Methodology, Data Structures and Algorithms (vi) Database Systems (vii) Computer Networks.

Chemical (Code 07)**Mathematics**

(i) Vector calculus (ii) Determinants and Matrices (iii) Analytic function theory (iv) Calculus and ordinary Differential Equations (v) Numerical Methods (vi) Probability and Statistics.

Other Topics

(i) Chemical process calculations (ii) Chemical Process Industries (iii) Mechanical Operations (iv) Fluid Mechanics (v) Heat Transfer (vi) Mass Transfer (vii) Thermodynamics (viii) Chemical Reaction Engineering (ix) Instrumentation & Control (x) Process Engineering Economics.

Bio Technology (Code 08)

Cell Structure – Function – Properties of Nucleic Acids - Protein Synthesis – Gene Manipulation – Transgenic Microbes, Plants and Animals – Metabolism and Bio Energetics – Gene Regulation – Enzyme Kinetics – Fermentation Process – Production of commercially important enzymes, Recombinant proteins – Microbial Growth Kinetics – Biosafety – Bioethics and Intellectual Property Rights – Bio conversion – **Fermentation Kinetics – Bioreactors**- Genomics and Proteomics – Computer Applications in Bio Technology -Nano Biotechnology – Application of Bio Technology – Systems Biotechnology.

GIS (Code 09)

Mathematics

(i) Vector calculus (ii) Determinants and Matrices (iii) Analytic function theory (iv) Calculus and ordinary Differential Equations (v) Numerical Methods (vi) Probability and Statistics.

Other Topics

Probability Theory – Physics of Remote Sensing – Sensor – Electromagnetic Radiation – Satellites – Photogrammetry – Surveying – Cartography – Digital Image Processing – GIS – Hardwares, Softwares – Data base Management – Electronic Surveying – GPS – EDM – Radar – Hydrology – Geological Remote Sensing – Soils – Pollution – Coastal zone – Urban Planning – Disaster.

Environmental (Code 10)

Mathematics

(i) Vector calculus (ii) Determinants and Matrices (iii) Analytic function theory (iv) Calculus and ordinary Differential Equations (v) Numerical Methods (vi) Probability and Statistics.

Other Topics

(i) Environmental Pollution (ii) Environmental Biotechnology (iii) Thermodynamics (iv) Ecology (v) Environmental Conservation (vi) Water Resources (vii) Ecology and Sustainable Development (viii) Remote Sensing (ix) Energy and Environmental (x) Environmental Impact Assessment (xi) Current Topics in Environmental Sciences (xii) Soil Pollution and Solid Waste Management (xiii) Natural Hazards (xiv) Environmental and Occupational Health

Food Processing (Code 11)

Bioprocess Engineering:

Properties of Vapors and Gases. Energy Balances/Conservation of Energy; Entropy; Ideal Gas Mixtures and Psychometrics. Steady-state Heat Transfer; One-dimensional Heat Conduction; Heat Transfer through a Composite Wall; Conduction, Forced Convection; Overall Heat Transfer Coefficient; Heat Exchangers; Radiation Heat Transfer. Basic bioprocess engineering and reactor concepts; Stoichiometry, mass and energy balances; Fluid flow and mixing in bioreactors; Heat transfer in bioprocesses; Mass transfer in bioprocess; Reaction and cell growth kinetics; Downstream processing unit operations. Process instrumentation

Food Engineering:

Dimensions and units, Evaporation, crystallization, distillation, mechanical separations, size reduction and mixing, properties of food, blanching, pasteurization, sterilization, extrusion, aseptic processing, drying, material handling, dairy plant engineering, cereal processing, fat and oil processing, sugar cane processing, food preservation, storage, non-thermal food processing, bakery and confectionary, meat and poultry processing, Food safety and waste management, food packaging technology

Biochemistry and nutrition:

Enzymes, Coenzymes, Cofactors, Elements of carbohydrates, fat and protein metabolism, Elements of photosynthesis, Food Requirements, Vitamins and their functions in the body, Minerals and their functions in body, Elements in protein biosynthesis-Nucleic acids and their importance.

Microbiology:

Microorganism, isolation of microorganism, identification, stains and staining techniques, Growth, nutrition and physiology of microorganism, diseases and control, microbial genetics, microbial spoilage in food, beneficial microorganism, probiotic and prebiotic. Fermentation-Process, types, design, Fermented food products. Enzymes-production-primary and secondary metabolites, application in food industry.