राष्ट्रीय प्रौद्योगिकी संस्थानश्रीनगर
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
(An autonomous Institute of National Importance under the aegis of Ministry of Education, Govt. of India)
हजरतबल, श्रीनगर, जम्मू-कश्मीर, 190006,भारत
Hazratbal, Srinagar Jammu and Kashmir, 190006, INDIA

SYLLABUS FOR TECHNICAL ASSISTANT

(Department of Mechanical Engineering and Workshop)

GENERAL APTITUDE SYLLABUS

Verbal Aptitude: Basic English grammar: tenses, articles, adjectives, prepositions, conjunctions, verb-noun agreement, and other parts of speech Basic vocabulary: words, idioms, and phrases in context Reading and comprehension Narrative sequencing
Quantitative Aptitude: Data interpretation: data graphs (bar graphs, pie charts, and other graphs representing data), 2- and 3-dimensional plots, maps, and tables Numerical computation and estimation: ratios, percentages, powers, exponents and logarithms, permutations and combinations, and series Mensuration and geometry Elementary statistics and probability
Analytical Aptitude: Logic: deduction and induction; Analogy Numerical relations and reasoning
Spatial Aptitude: Transformation of shapes: translation, rotation, scaling, mirroring, assembling, and grouping Paper folding, cutting, and patterns in 2 and 3 dimensions.

CORE BRANCH SYLLABUS

General laboratory knowledge & awareness:

- Practical knowledge in Handling, operation and maintenance of equipment(s) related to Mechanical Engineering Department laboratory.
- General Science (such as Physics, Chemistry, Mathematics & Environment)
- Basic questions related to various laboratory equipment in the Mechanical Engineering Department laboratory, Housekeeping and documentation.
- Troubleshooting all equipment/instrument used on various laboratories of Mechanical Engineering.

Computer Awareness
Basic knowledge of Computer Applications, viz; MS Word, MS Excel, Power Point etc. Internet, MS-DOS, UNIX, Windows, Data Entry, Software knowledge, Networking Platforms, applications of computers in mechanical/Industrial/Production engineering.

Engineering Mechanics:
Laws of Forces, Moment, Friction, Moment of Inertia, Centre of Gravity and Simple Machines.

Mechanics of Solids:
Stresses and Strains, Strain energy, toughness, hardness, fatigue, creep, Bending Moment and Shearing Force Diagrams, Bending Stresses, Columns & Torsion.

Thermodynamics:
Fundamental Concepts, Laws of Perfect Gases, Thermodynamic Processes on Gases, Laws of Thermodynamics, Ideal and Real Gases and Properties of Steam.

Fluid Mechanics:
Type and Properties of Fluids, Pressure and its Measurement, Flow of Fluids and Flow through Pipes.

Theory of Machines:
Simple Mechanisms, Friction, Power Transmission, gyroscope, Flywheel, Governor and Balancing.

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Heat-Transfer:
Modes of Heat Transfer, Fourier's Law, Steady State Conduction, Composite Structures, Natural and Forced Convection and Thermal Radiation.

Machining and Machine Tool Operations:
Cutting Tools and Cutting Materials, Lathe, Drilling, Boring, Shaping and Planing, Broaching, Jigs and Fixtures and Cutting Fluids and Lubricants, Welding, Pattern Making, Metal Forming Processes.

Engineering Materials:
Scope of Material Science, Crystallography, Metals and Alloys, Heat Treatment, Plastics and Advanced Materials.

Machine Design:
Design-Definition, Types of design, necessity of design, Design terminology: stress, strain, factor of safety, factors affecting factor of safety, stress concentration, methods to reduce stress concentration, fatigue, endurance limit, Design Failure, Design of Shaft, Design of Key, Design of Joints, Design of Flange Coupling and Design of Screwed Joints.

Automobile Engineering:
Automobile and its development, Classification of automobiles, Transmission System, Steering System, Braking System, Dynamo and Alternator and Exhaust Emissions.

Computer Integrated Manufacturing:
Introduction to NC, CNC & DNC, Construction and Tooling, Part Programming, System Devices, Problems in CNC Machines, Automation and NC system.

I.C. Engines:
Working principle of two stroke and four stroke cycle, SI engines and CI Engines, Otto cycle, Diesel cycle, Dual cycle, Fuel Supply and Ignition System in Petrol Engine, Fuel System of Diesel Engine, Cooling and Lubrication and Testing of IC Engines.

Metrology and Inspection:
Linear and Angular Measurement, Measurement of Surface Finish and Measurements of Screw threads and Gauges

Refrigeration and air-conditioning:
Fundamentals of Refrigeration, Vapour Compression System, Refrigerants, Air Refrigeration System, Vapour Absorption System and Refrigeration Equipment.

Turbo-machinery:
Introduction to Turbomachines, Classification of Turbomachines, Steam Turbines and Steam Condensers, Gas Turbines and Jet Propulsion

Vibrations:
Types-Longitudinal, Transverse and Torsional vibrations, Dampening of Vibrations, Causes of vibrations in Machines, their Harmful Effects and Remedies.