॥ सा विद्या या विमुक्तये ॥
ಭಾ.ತಂ.ಸಂ. ಧಾರವಾಡ
भा. प्रौ. सं. धारवाड
IIT DHARWAD

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Selection Process for the post of Junior Technician [MMAE]

(Staff Recruitment Advt. No.: IITDh/Admin/SR/29/2024-25 dated 26th August 2024)

All the shortlisted candidates are required to appear in person for the Written Test (s) scheduled on 9th July 2025 [Wednesday]. The venue for Written Test (s) is IIT Dharwad, Karnataka.

Candidates securing minimum qualifying marks as laid down by the selection committee in the Written Test I shall be shortlisted for Written Test II.

The final selection will be based on aggregate marks obtained from both the Written Tests (I & II) with weightage of 40% in Written Test I and 60% in Written Test II.

Examination Pattern:
Written Test –I (MCQ Type) (40% Weightage)

Section	Topics/Subjects	Time Duration
1	General Ability Test	**90 Minutes**
2	Technical	

Note: 0.60 Negative Marks for every wrong answer in the MCQ test.

Written Test-II (60% Weightage)

Section	Topics/ Subjects	Time Duration
3	Technical	**30 Minutes**
4	Technical Trade/Skill Test (Pen and Paper) (Questions basically linked to experiments)	**80 Minutes**

Note: 0.60 Negative Marks for every wrong answer in the MCQ test.

Syllabus:

Section	Broad syllabus
1	Synonyms and Antonyms, Error Spotting/ Correction, Phrasal Verbs, Idioms, and Phrases, etc. Number Series, Letter Series, Coding-Decoding, Direction Sense, Logical Reasoning, Mental Reasoning, Percentage, Average, Profit & Loss, Ratio & Proportion, Speed, Distance and Time, Simple and Compound Interest, Simplification, Mathematical Reasoning.
2 & 3	**Thermal Stream:** **Thermodynamics:** Zero, first, and second laws of thermodynamics; thermodynamic properties; reversible and irreversible processes; steady flow energy equation; entropy; thermodynamic cycles; Refrigeration cycles. **Fluid Mechanics & Turbomachines:** Physical properties of fluids; measurement of pressure; Pascal's law; hydrostatic law; mass conservation; Bernoulli's equation; Flow in pipes; Hydrodynamic force of jets on stationary and moving, inclined, and curved vanes, velocity triangles; work done; efficiency, flow over radial vanes; Different types of pumps and turbines.

	Heat Transfer: Basic modes of heat transfer and their analysis in different scenarios. **Design Stream:** **Engineering Mechanics:** Force Systems; Equilibrium of Rigid Bodies; Trusses And Cables; Friction Laws And Simple Machines; Dynamics; **Strength of Materials:** Stress And Strain; Generalized Hooke's Law; Transformation Of Stress And Strain; Bending And Deflection Of Beams; Torsion Of Circular Shafts; Thin-Walled Cylinders And Helical Springs; **Theory of Machines:** Fundamentals And Type Of Mechanisms; Velocity And Acceleration In Mechanisms; Cams And Followers; Belt, Chain And Gear Drives, Brakes And Clutches; Flywheel, Governor And Balancing; **Machine design:** Introduction To Design; Design Of Fasteners; Design Of Shafts, Keys; Design Of Simple Machine Parts L; Design Of Springs, Gears **Manufacturing Stream:** **Workshop Practices:** Fitting and carpentry workshop practices on metal casting, forming, sheet metal working, various hand tools & power tools, types of joints & its use. **Engineering Materials:** Structure and properties of engineering materials, phase diagrams, heat treatment, stress-strain diagrams for engineering materials. **Forming and Casting Processes:** Plastic deformation and yield criteria; fundamentals of hot and cold working processes; load estimation for bulk (forging, rolling, extrusion, drawing) and sheet (shearing, deep drawing, bending) metal forming processes; principles of powder metallurgy. Different types of castings, design of patterns, molds and cores; solidification and cooling; riser and gating design. **Joining techniques**: arc welding equipment and operator accessories; weld joints and position for arc welding; types of edge preparation; classification of arc welding electrodes; principles of gas welding, arc welding and resistance welding processes,. Principles of welding, brazing, soldering and adhesive bonding. **Machining and Machine Tool Operations:** Mechanics of machining; basic machine tools; single and multi-point cutting tools, tool geometry and materials, tool life and wear; economics of machining; principles of non-traditional machining processes; principles of work holding, jigs and fixtures; abrasive machining processes; NC/CNC machines and CNC programming. **Metrology and Inspection:** Limits, fits and tolerances; linear and angular measurements; comparators; interferometry; form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing and assembly; concepts of coordinate-measuring machine (CMM). **Computer Integrated Manufacturing:** Basic concepts of CAD/CAM and their integration tools; additive manufacturing.
4	Fitting, Welding, CNC programming, Machining, carpentry, sheet metal, casting, Forging, Machine maintenance, Safety protocol, Drafting, Engg Graphics, Metrology, Material Testing, (Including Experiments)