



Selection Process for the post of Junior Technician (Postcode 14)

(Staff Recruitment Advt. No: IITDH/ Admin/Staff Recruitment/25/2023-24 dated 1st February 2023)

All the shortlisted candidates are required to appear in person for the Written Test (s). The venue for Written Test (s) is IIT Dharwad, WALMI Campus, Belur Industrial Area, Near High Court Bench, Pune - Bengaluru Road, Dharwad, Karnataka.

Candidates securing minimum qualifying marks as laid down by the selection committee in 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
1	General Ability Test
2	Technical Questions

Note: 0.25 Negative Marks for every wrong answer MCQ test.

Written Test-II (60% Weightage)

Section	Topics/ Subjects
3	Technical
4	Technical Trade/Skill Test (Pen and Paper)

Note: 0.25 Negative Marks for every wrong answer in MCQ questions, If any.

Syllabus:

Section	Broad syllabus
1	General Awareness, Reasoning, Quantitative Aptitude, Communication Skills
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;

	<p>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;</p> <p>Machine design: Introduction To Design; Design Of Fasteners; Design Of Shafts, Keys; Design Of Simple Machine Parts L; Design Of Springs, Gears</p> <p>Manufacturing Stream:</p> <p>Workshop Practices: Fitting and carpentry workshop practices on metal casting, forming, sheet metal working, various hand tools & power tools, types of joints & its use.</p> <p>Engineering Materials: Structure and properties of engineering materials, phase diagrams, heat treatment, stress-strain diagrams for engineering materials.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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).</p> <p>Computer Integrated Manufacturing: Basic concepts of CAD/CAM and their integration tools; additive manufacturing.</p>
4	<p>Fitting, Welding, CNC programming, Machining, carpentry, sheet metal, casting, Forging, Machine maintenance, Safety protocol, Drafting, Engg Graphics, Metrology, Material Testing, (Including Experiments)</p>