

Department of Industrial & Production Engineering

Technical Assistant

Stage-I (Screening Test)

Stage-I (Screening Test): A screening test shall be conducted in the first phase in form of multiple choice written test. Written test shall be of **90 minutes'** duration comprising of **75 questions**. Each **correct answer will be awarded One [1] mark** and for each **wrong answer One-fourth [1/4] mark shall be deducted**. Screening test shall consist of questions on **General English**(Tenses, Active and Passive, Direct and Indirect speech, Punctuation, Correction of sentences, One word substitutes, Modals, Articles, Clauses, Synonyms, Antonyms, Idioms and Phrases); **Numerical Aptitude Arithmetic**(Simplification of Fractions, Simple and Compound Interest, Profit and Loss, Percentage, Averages, Number System, Time and Work, Problems on Trains, Calendar, Area, Problems on Numbers, Square root, Cube root, Time and Distance and Other basic Arithmetic related matters);**Reasoning and Data Interpretation** (Number Series Compilation, Missing Number finding, Pattern series, Direction Sense Test, Series Compilations, Classification, Missing Character finding, odd man out, Blood relations, Analogy, Coding and Decoding, Letter and Symbol Series, Verbal reasoning, Statement and Conclusions, Letter and Symbol Series, Logical Problems, Arithmetic reasoning, Logical Sequence of words, Pie Chart and Bar Chart).

Eligible candidates **Ten Times** of the positions in each category will be screened for the Stage-II subject to the fulfillment of all educational qualification etc. as per the Recruitment Rules-2019.

Stage-II (Skill test)

Stage-II (Skill Test): The skill test will be of qualifying nature.

Laboratory Experiments etc. as per nature of the post shall be conducted in the respective laboratories/field. Minimum qualifying marks in the skill test will be [UR:30%; EWS:27%; OBC:27%; SC:20%; ST:20%; PwD:15%].

The candidates, who will qualify the skill test, will be called for the final written test. The Candidates appearing in the written test must ensure their eligibility for the particular category of post. The documents in support of their eligibility shall be verified before the Final test. If

any candidate will not have requisite qualification etc. as per the post for which he is appearing will not be allowed to sit in the final test (Stage-III).

Stage-III (Final test)

Stage-III (Final Test): Final written test shall be of 2 hours duration comprising of 100 multiple choice questions.

Each **correct answer will be awarded One [1] mark** and for each **wrong answer One-fourth [1/4] mark shall be deducted**. Only those who are screened in after the Screening test [Stage –I] and qualify the Skill Test [Stage-II] will be allowed to appear in the Final Test [Stage III]. The minimum passing marks in Final test will be [UR:30%; EWS:27%; OBC:27%; SC;20%; ST:20%; PwD:15%].

The final merit list shall be drawn on the basis of the stage-III written test.

SYLLABUS FOR SKILL TEST AND FINAL WRITTEN TEST IS AS PER ANNEXURE-IV.

Department of Industrial & Production Engineering

Syllabus for Skill Test (Technical Assistant)

Demonstration on various laboratory equipment/software/programming:

Equipment in various labs: Automation equipment, conventional and CNC machines, metrology equipment, ergonomic equipment etc.

Software's: Auto-CAD, CREO, Solid works, Automation Studio, Flexsim, SPSS, Tinker CAD, Ergomaster etc.

Programming: Python, PLC, Robotics, Micro Controller, CNC etc.

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Syllabus for Final written test (Technical Assistant)

General English: Spellings/ Detecting misspelt words, common errors, active/ passive voice of verbs, comprehension passage, spot the error, cloze passage, fill in the blanks, shuffling of sentence parts, conversions, sentence rearrangement, shuffling of sentences in a passage, improvement of sentences, Synonyms/ Homonyms, Antonyms, Vocabulary, Idioms & Phrases, one word substitution.

Computer awareness: Basic knowledge of computer applications, like MS Office (Word, Excel, Power Point etc), Internet, MS-DOS, computer generation & development, Windows, Data Entry (Letter, Drafting, Paragraph rephrasing, Pie-Chart, Bar-Chart, Line-Chart), Networking Platforms.

Aptitude and Reasoning: Probability, time and distance, quadratic equations, odd man out, races and games, numbers and ages, averages, mensuration, profit and loss, problems on numbers, pipes and cisterns, indices and surds, simple equations, permutations and combinations, compound interest, boats and streams, simplification and approximation, mixtures and allegations, simple interest, problems on LCM and HCF, time and work partnership, problems on trains, ratio and proportion, areas, volumes, percentages.

Problems on logical thinking, alphanumeric series, coding & decoding problems, letter & number series, blood relation puzzles, odd man out problems, analogy problems, common sense test, problems on alphabetical arrangement of words, date and calendar problems, sense of direction problems, ranking and sitting arrangements

Engineering Mechanics: Equilibrium of forces, law of motion, friction, centroid of a plane area, screw jack, system of pulleys, projectile, work, power, energy.

Strength of Materials: Stress and strain, elastic limit and elastic constants, thermal stresses, bending moments and shear force diagram, torsion of circular shafts, columns and struts.

Theory of Machines: Concept of simple machine, four bar linkage and link motion, flywheel, power transmission by belts and gears.

Thermal Engineering: Thermodynamic systems and processes, properties of pure substances, behaviour of ideal and real gases, Laws of thermodynamics, compressors, vapour and gas power cycles, Air-standard (Otto, Diesel and Dual cycles), vapour and gas refrigeration and heat pump cycles. Heat Transfer: Modes of heat transfer (conduction, convection and radiation)

Engineering Materials: Structure and properties of engineering materials, phase

diagrams, heat treatment (annealing, hardening, tempering, carburizing, normalizing etc.), stress-strain diagrams for engineering materials.

Production Engineering: *Welding:* arc welding, gas welding, resistance welding, brazing and soldering, welding defects. *Foundry & Casting:* methods, defects, different casting processes. *Forming:* Extrusion, forging, rolling, drawing and bending operations. *Metalcutting:* basic machine tools, single and multi-point cutting tools, tool geometry and materials, basic principles of machining with lathe, milling, drilling, shaping and grinding.

Machine Drawing: First and third angle projection methods, orthographic views, isometric views, projections of lines, planes and solids, Assemblies of various engineering products.

Metrology: Limits and fits, measurement errors, principle of measuring instruments, linear, angular and taper measurements, screw thread measurement, measurement of circularity, comparators, measurement of surface finish, force etc.

Industrial Automation & IIOT: Pneumatics, Hydraulics, Electro-Pneumatic/Hydraulics, PLC Programming, Sensors, Actuators, microcontrollers and processors.

Ergonomics/Bio-Medical Instrumentation: Usage and maintenance of various instruments - Measurement of blood pressure, Heart rate, sound measurement, knowledge of spirometer, Audiometers, method and time study etc.

Subtractive & Additive Manufacturing: Introduction to CNC machine, Construction and Tooling, Programming of CNC machines, operations & maintenance of 3D Printers, various conventional/non-conventional machines.