

## **Selection Pattern for various positions** **vide advertisement No. inStem/04/2022**

Sl	Post Name	Level of the post	Mode of selection	Remarks
1	Senior Engineer (Instrumentation/ Electrical/HVAC)	Level 13	Interview or two stages of interview based on the no of candidates shortlisted	The candidates who will score 60% and 55% marks for UR and OBC categories respectively will be considered for final selection in order of merit
2	Engineer (Technology Documentation Officer)	Level 11		
3	Engineer (Instrumentation)	Level 11		
4	Sr. Technical Officer (Electrical)	Level 9	Written test followed by an interview	70 % weightage to written test and 30 % to interview will be given. Overall should score above 60%. Maximum of 10 Candidates in order of merit who have scored above 50% in Written test will be called for interview.
5	Technical Assistants	Level 6	Written test followed by skill test	Maximum 10 Candidates in order of merit who have scored minimum of 60, 55 & 50 % marks under UR, OBC & SC categories respectively in the written test will be called for skill test. The Skill test will be qualifying in nature and will not be counted for the final merit list
6	Lab Technician	Level 4		
7	Clerk	Level 3		

## **Syllabus for various positions** **vide advertisement No. inStem/04/2022**

<b>Sr. Technical Officer (Level-9) –Electrical</b>	<b>Total 100 Marks</b>
<b>General Aptitude (English, Reasoning, Numerical Ability and General Knowledge/Current affairs)</b>	<b>30 Marks</b>
<b>Subject &amp; Experience Based</b>	<b>70 Marks</b>
Design, operation & maintenance of Electric Power Systems having Transformers, DG sets, HT/LT Panels, Cables, Earthing, Lightning protection, building electrifications, fault calculations etc. Energy efficiency and conservation requirements for existing buildings Motor control circuits and protection mechanisms. Design of Illumination levels, lighting circuit, Latest trends in lighting technologies and their advantages. Power Electronics: UPS systems, design of battery banks and their calculations, VFDs, Harmonics & mitigation etc. Operation and maintaining PLC/DCS/SCADA / Building management system CPWD norms for works, Estimation, costing and tendering procedures Knowledge of INDIAN ELECTRICITY RULEs, Indian standards & NATIONAL ELECTRICAL CODE Contract management, CLRA act etc.	

<b>Technical Assistant (Level-6) –Instrumentation-</b>	<b>Total 100 Marks</b>
<b>General Aptitude (English, Logical reasoning, Numerical Ability and General knowledge/Current affairs)</b>	<b>15 Marks</b>
<b>Subject &amp; Experience Based</b>	<b>85 Marks</b>
Instrumentation Engineering, Basic of Telecom Networking/EPABX, Audio – Visual System, Access Control/Audio Video Conference, Centralized gas line/Compressed air line/Vacuum line.  Biological research equipment. Basic Principle, function & application of following equipment:Centrifuge,FPLC/HPLC,Spectrophotometer,LCMS/GCMS,NMR,FTIR,Microscopes, Stereo/Inverted/Electron Microscopes, PCR/RT PCR. Basic Principles of Laser, Incubators, Deep Freezers, Measurement of voltage, current, temperature, pressure, flow, light, intensity, phase velocity, acceleration: Grounding, shielding, earthing and instrumentation grounding, Sensors & Transducers – Resistive, Capacitive, inductive, piezoelectric, Hall effect, Thermocouple, RTD etc. Designing of Projection and Sound system in Lecture, AV cables and Protocols, Type of Projectors etc. Designing of Centralize Gas, Vacuum and Compressed air line. Cylinder pressure, regulators,auto changeover, RFID based Access control system principle and design. Basics of telecom networking and EPABX, PRI/BRI etc. Basic Electronics/ Electronics	

<b>Technical Assistant (Level-6) –HVAC</b>	<b>Total 100 Marks</b>
General Aptitude (English, Logical reasoning, Numerical Ability and General knowledge/Current affairs)	
<b>15 Marks</b>	
<b>Subject &amp; Experience Based</b>	
<b>85 Marks</b>	
<b><u>Air Conditioning &amp; Refrigeration and Mechanical (60 Marks)</u></b>	
<p>Basics &amp; Principles of Heating, Ventilation, Air Conditioning &amp; Refrigeration. Basics of Psychrometry Components, Operation &amp; Maintenance of Central Air Conditioning system with water- &amp; air-cooled chillers, VRF &amp; Packaged system, Unitary products. Basics of Mechanical Measurement &amp; devices – Pressure, Temp, Flow, Vibration. Basics of Thermodynamics – Sensible Heat, Latent Heat, Enthalpy, Entropy, Isochoric, Isobaric, Adiabatic processes. Basics of Belt drives, Fans, Bearings. Basics of Pumping, Piping system &amp; Components. Chilled and Condensate Water Hygiene &amp; critical parameters. Refrigerant properties, application &amp; environmental impact. Energy Efficiency measures. Material Management. Cost estimate/Market rate analysis of HVAC components.</p>	
<b><u>Electrical (25 Marks)</u></b>	
<p>Fundamentals of Electrical components &amp; circuits. Basics of Electric Motors &amp; starter configurations and control panels including protection devices. Basics of Building Management System (BMS) and its components. Basics of Electrical Measurement &amp; devices – Voltage, Current, Insulation, resistance. Basics &amp; Operation of Variable Frequency Drives, transducers, sensors.</p>	

<b>Technical Assistant (Level-6) –Civil</b>	<b>Total 100 Marks</b>
General Aptitude (English, Logical reasoning, Numerical Ability and General knowledge/Current affairs)	
<b>15 Marks</b>	
<b>Subject &amp; Experience Based</b>	
<b>85 Marks</b>	
<p><b><u>Building services:</u></b> Solar hot water system, Firefighting system, Water treatment (RO, Softening, filtrations, ionizations etc.), Sewerage systems, Sewage treatment plant, Principles of plumbing, Internal and external plumbing, Plumbing fixtures, Quality of water and sewage, test results, Basic design concepts of plumbing network, Roads and Landscape.</p>	
<p><b><u>Building Materials:</u></b> Different types of materials, Physical (Including mechanical properties) and chemical properties of following building materials; Steel, Cement, Aggregates, Concrete blocks, Bricks, Gypsum, Flooring materials (Kota, granite, Epoxy, PU, Vinyl), Different types of paintings and its usage and application areas, Glass, Aluminium, Plumbing items (Pipes, fixtures etc).</p>	
<b><u>Concrete Technology:</u></b>	
<p>Concrete composition, Concrete physical properties, Basic tests on concrete and discussions on test results, Water quality for concrete, Concrete batching, mixing, transporting, placing, compacting and finishing, Basics on workability and durability of concrete. Grades of concrete, Concrete admixtures fundamentals of concrete design concepts.</p>	
<b><u>RCC Design (Only basic design concepts shall be focused):</u></b>	
<p>Basics of Concrete design: Foundation, Compression members, Flexural members. Basics of Steel design: Welding, Bolt and rivet connections.</p>	

**Estimation and Costing:** Questions will be on Estimation and mode of measurements on the following topics, Earthwork, Concrete, Masonry, Flooring, Steel reinforcement, Shuttering, joinery works, Finishing works, and Plumbing works.

**Works Tendering Procedures:** Types of contracts, Types of tendering, Tender characteristics, Tender awarding etc.

**Construction Project Management:** Time, cost management, Basics of Project planning and scheduling, network analysis, CPM and PERT development etc.

Lab Technician (Level-4)	Total 100 Marks
General Aptitude (English, Logical reasoning, Numerical Ability and General knowledge/Current affairs)	20 Marks
<b>Subject specific:</b>	<b>80 Marks</b>
Basics of Cell and Molecular biology, Food, Nutrition and Health, Fundamental of Biochemistry, Basic Chemistry	

Clerk (Level-3)	Total 100 Marks
Language Awareness English and Hindi	10 Marks
Numerical Ability & Quantitative Aptitude	20 Marks
Logical Reasoning	10 Marks
General knowledge/Current affairs	10 Marks
Office procedures as per Central Govt Rules	20 Marks
Basic Administration, Accounts and Purchase rules	30 Marks

**Note:** Every correct answer will carry one mark and no mark will be allotted for unattempted questions. There will be a negative marking of .25 marks for each wrong answer.