

**SYLLABUS FOR TECHNICAL POSITIONS VIDE INSTEM**  
**ADVERTISEMENT NO. INSTEM/13 /2020**

<b>Technical Officer-II (Level-8)– Instrumentation</b>	<b>Total 100 Marks</b>
<b>General Aptitude (5 questions each English, Reasoning and current affairs)</b>	<b>15 Marks</b>
<b>Subject &amp; Experience Based</b>	<b>85 Marks</b>
<p>Instrumentation Engineering, Basic of Telecom Networking/EPABX, Audio – Visual System, Access Control/Audio Video Conference, Centralized gas line/Compressed air line/Vacuum line.</p> <p>Biological research equipment. Basic Principle, function &amp; application of following equipment:- Centrifuge, FPLC/HPLC, Spectrophotometer, LCMS/GCMS, NMR,FTIR, Microscopes, Stereo/Inverted/Confocal/AFM/Electron Microscope (TEM&amp; SEM), Cryo Electron Microscopes, CCD Cameras, PCR/RT PCR Basic Principles, Laser, Incubators, Deep Freezers Measurement of voltage, current, temperature, pressure, flow, light, intensity, phase velocity, acceleration: Grounding, shielding, earthing and instrumentation grounding, Sensors &amp; 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, RF ID based Access control system principle and design. Basic of telecom networking and EPABX, PRI/BRI etc. Basic Electronics/ Electronics</p>	

<b>Technical Officer-I (Level-7) – Lab Support</b>	<b>Total 100 Marks</b>
<b>General Aptitude (5 questions each English, Reasoning and current affairs)</b>	<b>15 Marks</b>
<b>Subject &amp; Experience Based</b>	<b>85 Marks</b>
<p>Principles of Laboratory Management, Operations Management, Human Resource Management, Financial Management, Fire Safety, Bio-safety, Chemical Safety</p>	

<b>Technical Officer-I (Level-7)– HVAC</b>	<b>Total 100 Marks</b>
<b>General Aptitude (5 questions each English, Reasoning and current affairs)</b>	<b>15 Marks</b>
<b>Subject &amp; Experience Based</b>	<b>85 Marks</b>
<p><b>(Electrical/Mechanical)</b></p> <p>Basics of Power electronics , Industrial drives and control, Motor controls, Switchgear installation</p> <p>Electrical engineering materials, Fundamentals of digital electronics, Thermal engineering, Heat exchangers, CNC machines, Estimation &amp; costing, Principles of Air conditioning, Fundamentals of HVAC, Cooling and Dehumidification methods, Indoor Air Quality, Comfort Air Conditioning Systems, Ventilation requirements, Air filtrations, Air distribution ,Thermal Insulation</p> <p>HVAC Systems of Containment facilities, Animal Facilities, Clean rooms and Data centres Cooling towers and Evaporative Cooling Systems, Precision Air Conditioning System Building Management System, PLC, SCADA and Process Controls</p>	

<b>Technical Assistant (Level-6) –Instrumentation</b>	<b>Total 100 Marks</b>
<b>General Aptitude (5 questions each English, Reasoning and current affairs) 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/Confocal/AFM/Electron Microscope (TEM& SEM), Cryo Electron Microscopes, PCR/RT PCR Basic Principles, 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, RF ID based Access control system principle and design. Basic of telecom networking and EPABX, PRI/BRI etc. Basic Electronics/ Electronics	

<b>Technical Assistant (Level-6) –HVAC</b>	<b>Total 100 Marks</b>
<b>General Aptitude (5 questions each English, Reasoning and current affairs) 15 Marks</b>	
<b>Subject &amp; Experience Based</b>	<b>85 Marks</b>
<b>(Electrical/Mechanical)</b>	
Work Planning and analysis, Manpower Management, Equipment and material Management Cost and Technical analysis Fundamentals of Electrical Circuits and Components, Principle of Electromagnetism, Electric Motor Drives, Protective Devices, Basics of Electrical Engineering components, Basics of Electronics, Motor controls, Basics of Refrigeration, Basics of Mechanical Measurements ,Basic Thermal Engineering, machine tool technologies, basics of machine design, Principles of Refrigeration, PT Charts, Refrigerants in the market, Water qualities for Chillers, General maintenance issues and remedies, VRF Systems	

<b>Technical Assistant (Level-6) –IT</b>	<b>Total 100 Marks</b>
<b>General Aptitude (5 questions each English, Reasoning and current affairs) 15 Marks</b>	
<b>Subject &amp; Experience Based</b>	<b>85 Marks</b>
Installation and troubleshooting Windows/MacOS/Linux, Troubleshooting Hardware issues in Laptops/Desktops/Servers/Printers/WiFi Routers/Smart Phones, Linux Administration and Scripting , Compilation process of opensource code ,Writing Scripts in BASH/python/perl, Common linux commands to search content and files/directories	
Common command line text editors , Troubleshooting linux servers using command line tools and System logs,ext3/ext4/GPFS/Lustre/XFS file systems,	
Installation/Maintenance/Configuration of Routers/Switches, Subnetting, Network Management Systems(NMS),Performing Backups/Restoration on Tape media using open-source tools ,Monitoring Servers/Network uptimes ,Virtualization using Vmware/Hyper-V/Xen/KVM, Inventory Management,Common Application/OS level Security Risk management ,	
Website development/Content updation/PHP Development of basic website, Session/Cookie management, Object-Oriented Programming	

<b>Technical Assistant (Level-6) –Electrical</b>	<b>Total 100 Marks</b>
<b>General Aptitude (5 questions each English, Reasoning and current affairs)</b>	<b>15 Marks</b>
<b>Subject &amp; Experience Based</b>	<b>85 Marks</b>
Basic Electrical Engineering Concepts, Alternating Current Fundamentals, Utilisation of Electrical Energy, Power Systems, Power Electronics & Drives, Network Theory, Electrical Machines, Analog and Digital Electronics, Estimation and costing, Measurement and measuring instruments, Basic Electronics etc	

<b>Technical Assistant (Level-6) –Civil</b>	<b>Total 100 Marks</b>
<b>General Aptitude (5 questions each English, Reasoning and current affairs)</b>	<b>15 Marks</b>
<b>Subject &amp; Experience Based</b>	<b>85 Marks</b>
IS codes, Design basic – Civil, structural, PH, Hydraulics, Construction, Construction Materials Testing, Maintenance of laboratories, Landscape, General civil engineering buildings/construction, Pollution control board norms, compliances, CFO procedures, Water proofing technologies, applications, Office procedures, estimates, approvals, Tenders, post Tendering actions, execution procedures, extra items, substitute items, running account bills, final bills, post completion procedures	

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