



# भारतीय प्रौद्योगिकी संस्थान जोधपुर Indian Institute of Technology Jodhpur

## Syllabus for the post of JUNIOR TECHNICAL ASSISTANT (Computer Center)

### Written Test & Trade Test

<b>Linux Server Administration:</b>	
Understand and use essential tools	<ul style="list-style-type: none"><li>- Access a shell prompt and issue commands with correct syntax</li><li>- Use input-output redirection (&gt;, &gt;&gt;,  , 2&gt;, etc.)</li><li>- Use grep and regular expressions to analyze text</li><li>- Access remote systems using SSH</li><li>- Log in and switch users in multiuser targets</li><li>- Archive, compress, unpack, and uncompress files using tar, star, gzip, and bzip2</li><li>- Create and edit text files</li><li>- Create, delete, copy, and move files and directories</li><li>- Create hard and soft links</li><li>- List, set, and change standard ugo/rwx permissions</li><li>- Locate, read, and use system documentation including man, info, and files in /usr/share/doc</li></ul>
Create simple shell scripts	<ul style="list-style-type: none"><li>- Conditionally execute code (use of: if, test, [], etc.)</li><li>- Use Looping constructs (for, etc.) to process file, command line input</li><li>- Process script inputs (\$1, \$2, etc.)</li><li>- Processing output of shell commands within a script</li><li>- Processing shell command exit codes</li></ul>
Operate running systems	<ul style="list-style-type: none"><li>- Boot, reboot, and shut down a system normally</li><li>- Boot systems into different targets manually</li><li>- Interrupt the boot process in order to gain access to a system</li><li>- Identify CPU/memory intensive processes and kill processes</li><li>- Adjust process scheduling</li><li>- Manage tuning profiles</li><li>- Locate and interpret system log files and journals</li></ul>

	<ul style="list-style-type: none"> <li>- Preserve system journals</li> <li>- Start, stop, and check the status of network services</li> <li>- Securely transfer files between systems</li> </ul>
Configure local storage	<ul style="list-style-type: none"> <li>- List, create, delete partitions on MBR and GPT disks</li> <li>- Create and remove physical volumes</li> <li>- Assign physical volumes to volume groups</li> <li>- Create and delete logical volumes</li> <li>- Configure systems to mount file systems at boot by universally unique ID (UUID) or label</li> <li>- Add new partitions and logical volumes, and swap to a system non-destructively</li> </ul>
Create and configure file systems	<ul style="list-style-type: none"> <li>- Create, mount, unmount, and use vfat, ext4, and xfs file systems</li> <li>- Mount and unmount network file systems using NFS</li> <li>- Extend existing logical volumes</li> <li>- Create and configure set-GID directories for collaboration</li> <li>- Configure disk compression</li> <li>- Manage layered storage</li> <li>- Diagnose and correct file permission problems</li> </ul>
Deploy, configure, and maintain systems	<ul style="list-style-type: none"> <li>- Schedule tasks using at and cron</li> <li>- Start and stop services and configure services to start automatically at boot</li> <li>- Configure systems to boot into a specific target automatically</li> <li>- Configure time service clients</li> <li>- Install and update software packages from Red Hat Network, a remote repository, or from the local file system</li> <li>- Work with package module streams</li> <li>- Modify the system bootloader</li> </ul>
Manage basic networking	<ul style="list-style-type: none"> <li>- Configure IPv4 and IPv6 addresses</li> <li>- Configure hostname resolution</li> <li>- Configure network services to start automatically at boot</li> <li>- Restrict network access using firewall-cmd/firewall</li> </ul>
Manage users and groups	<ul style="list-style-type: none"> <li>- Create, delete, and modify local user accounts</li> <li>- Change passwords and adjust password aging for local user accounts</li> <li>- Create, delete, and modify local groups and group memberships</li> </ul>

	<ul style="list-style-type: none"> <li>- Configure superuser access</li> </ul>
Manage security	<ul style="list-style-type: none"> <li>- Configure firewall settings using firewall-cmd/firewalld</li> <li>- Create and use file access control lists</li> <li>- Configure key-based authentication for SSH</li> <li>- Set enforcing and permissive modes for SELinux</li> <li>- List and identify SELinux file and process context</li> <li>- Restore default file contexts</li> <li>- Use boolean settings to modify system SELinux settings</li> <li>- Diagnose and address routine SELinux policy violations</li> </ul>
Manage containers	<ul style="list-style-type: none"> <li>- Find and retrieve container images from a remote registry</li> <li>- Inspect container images</li> <li>- Perform container management using commands such as podman and skopeo</li> <li>- Perform basic container management such as running, starting, stopping, and listing running containers</li> <li>- Run a service inside a container</li> <li>- Configure a container to start automatically as a systemd service</li> <li>- Attach persistent storage to a container</li> </ul>
Cluster Management	<ul style="list-style-type: none"> <li>- Job management</li> <li>- Queue maintenance</li> <li>- Slurm/PBS</li> <li>- Kubernetes Basics</li> </ul>
<b>Network and Hardware Administration:</b>	
Network Fundamentals	<ul style="list-style-type: none"> <li>- Introduction to the OSI Model</li> <li>- Introduction to IPv4 (Internet Protocol)</li> <li>- IPv4 Packet Header</li> <li>- Address Resolution Protocol (ARP)</li> <li>- Introduction to TCP and UDP</li> <li>- TCP Header</li> <li>- Introduction to ICMP</li> <li>- Introduction to DNS</li> <li>- User mode and Privileged mode</li> </ul>
VLANs	<ul style="list-style-type: none"> <li>- VLANs Basic</li> <li>- How to configure VLANs</li> </ul>

Wireless	<ul style="list-style-type: none"> <li>- Introduction to Wireless Networks</li> <li>- Introduction to Wireless LANs</li> <li>- Wireless LAN 802.11 Service Sets</li> <li>- Introduction to Wireless Security</li> <li>- Wireless Authentication Methods</li> <li>- Wireless Encryption and Integrity</li> <li>- Wi-Fi Protected Access (WPA)</li> <li>- WLC WPA2 PSK Authentication</li> </ul>
IP Connectivity	<ul style="list-style-type: none"> <li>- Introduction to Routers and Routing</li> <li>- Router Basic Configuration</li> <li>- Introduction to Wide Area Networks (WAN)</li> </ul>
IPv4 Subnetting	<ul style="list-style-type: none"> <li>- Introduction to Subnetting</li> <li>- Basics of Binary Numbers</li> <li>- Subnetting in Binary, Decimal (Fast Method)</li> <li>- Classless Inter-Domain Routing (CIDR)</li> <li>- Variable Length Subnet Mask (VLSM)</li> <li>- Route Summarization</li> <li>- Hexadecimal to Binary and Decimal Conversion</li> <li>- Create a Subnetting Cheat Sheet</li> </ul>
IPv6	<ul style="list-style-type: none"> <li>- Introduction to IPv6</li> <li>- Shortening IPv6 Addresses</li> <li>- How to find IPv6 Prefix</li> <li>- IPv6 Address Types</li> <li>- IPv6 Address Assignment Example</li> <li>- IPv6 Summarization</li> </ul>
Routing	<ul style="list-style-type: none"> <li>- Default Gateway</li> <li>- Static Routing</li> <li>- IPv6 Static Route</li> <li>- IP Routing Explained</li> <li>- Router on a Stick</li> <li>- InterVLAN Routing</li> </ul>
OSPF (OPEN SHORTEST PATH FIRST)	<ul style="list-style-type: none"> <li>- Introduction to OSPF</li> <li>- OSPF Configuration</li> <li>- OSPF Packets and Neighbor Discovery</li> <li>- OSPF Reference Bandwidth</li> <li>- OSPF Router ID</li> </ul>
DHCP (Dynamic Host Configuration Protocol)	<ul style="list-style-type: none"> <li>- Introduction to DHCP</li> <li>- DHCP Server Configuration</li> <li>- DHCP Relay Agent</li> <li>- DHCP Client</li> <li>- DHCP Server IPv6 Configuration</li> </ul>
SNMP	<ul style="list-style-type: none"> <li>- Introduction to SNMP</li> </ul>

NAT	<ul style="list-style-type: none"> <li>- Introduction to NAT and PAT</li> <li>- NAT Static &amp; Dynamic</li> <li>- Port Address Translation (PAT)</li> </ul>
(QoS) Quality of Service	<ul style="list-style-type: none"> <li>- Introduction to Quality of Service (QoS)</li> <li>- IP Precedence and DSCP Values</li> <li>- Classification</li> </ul>
Automation and Programmability	<ul style="list-style-type: none"> <li>- Device Programmability</li> <li>- REST API</li> <li>- Data Models and Structures</li> <li>- Introduction to Software-Defined Networking (SDN)</li> <li>- Spine and Leaf Architecture</li> </ul>
Cloud Computing	<ul style="list-style-type: none"> <li>- Virtual Machines and Containers</li> <li>- Introduction to Cloud Computing</li> <li>- Cloud Connectivity</li> </ul>
Hardware and Assembling	<ul style="list-style-type: none"> <li>- PC Components</li> <li>- Network Switch and Routers</li> <li>- Power supply</li> <li>- Rack maintenance</li> </ul>

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