

Indian Institute of Technology Jodhpur

## Syllabus for the post of JUNIOR TECHNICAL SUPERINTENDENT (Computer Center) (WRITTEN TEST & SKILL TEST)

Server Administration:				
Understand and	- Access a shell prompt and issue commands with correct syntax			
use essential tools	- Use input-output redirection (>, >>,  , 2>, etc.)			
	- Use grep and regular expressions to analyze text			
	- Access remote systems using SSH			
	- Log in and switch users in multiuser targets			
	- Archive, compress, unpack, and uncompress files using tar, star, gzip, and bzip2			
	- Create and edit text files			
	- Create, delete, copy, and move files and directories			
	- Create hard and soft links			
	- List, set, and change standard ugo/rwx permissions			
	<ul> <li>Locate, read, and use system documentation including man, info, and files in /usr/share/doc</li> </ul>			
Create shell scripts	- Conditionally execute code (use of: if, test, [], etc.)			
	- Use Looping constructs (for, etc.) to process file, command line input			
	- Process script inputs (\$1, \$2, etc.)			
	- Processing output of shell commands within a script			
	- Processing shell command exit codes			
Operate running	- Boot, reboot, and shut down a system normally			
systems	- Boot systems into different targets manually			
	- Interrupt the boot process in order to gain access to a system			
	- Identify CPU/memory intensive processes and kill processes			
	- Adjust process scheduling			
	- Manage tuning profiles			
	- Locate and interpret system log files and journals			
	- Preserve system journals			
	- Start, stop, and check the status of network services			
	- Securely transfer files between systems			
Configure local	- List, create, delete partitions on MBR and GPT disks			
storage	- Create and remove physical volumes			
	- Assign physical volumes to volume groups			
	- Create and delete logical volumes			
	- Configure systems to mount file systems at boot by universally unique ID (UUID) or label			
	- Add new partitions and logical volumes, and swap to a system non- destructively			

Create and	- Create, mount, unmount, and use vfat, ext4, and xfs file systems			
configure file	- Mount and unmount network file systems using NFS			
systems	- Extend existing logical volumes			
	- Create and configure set-GID directories for collaboration			
	- Configure disk compression			
	- Manage layered storage			
	- Diagnose and correct file permission problems			
Deploy, configure,	- Schedule tasks using at and cron			
and maintain	- Start and stop services and configure services to start automatically at boo			
systems	- Configure systems to boot into a specific target automatically			
	- Configure time service clients			
	- Install and update software packages from Red Hat Network, a remote			
	repository, or from the local file system			
	- Work with package module streams			
	- Modify the system bootloader			
Manage basic	- Configure IPv4 and IPv6 addresses			
networking	- Configure hostname resolution			
	- Configure network services to start automatically at boot			
	- Restrict network access using firewall-cmd/firewall			
Manage users and	- Create, delete, and modify local user accounts			
groups	- Change passwords and adjust password aging for local user accounts			
	- Create, delete, and modify local groups and group memberships			
	- Configure superuser access			
Manage security	- Configure firewall settings using firewall-cmd/firewalld			
	- Create and use file access control lists			
	- Configure key-based authentication for SSH			
	- Set enforcing and permissive modes for SELinux			
	- List and identify SELinux file and process context			
	- Restore default file contexts			
	- Use boolean settings to modify system SELinux settings			
	- Diagnose and address routine SELinux policy violations			
Manage	- Find and retrieve container images from a remote registry			
containers	- Inspect container images			
	- Perform container management using commands such as podman and			
	skopeo			
	- Perform basic container management such as running, starting, stopping,			
	and listing running containers			
	- Run a service inside a container			
	- Configure a container to start automatically as a systemd service			
	- Attach persistent storage to a container			
Cluster	- Job management			
Management	- Queue maintenance			
	- Slurm/PBS			
	- Kubernetes Basics			

Network and Har	Network and Hardware Administration:				
Network	- Introduction to the OSI Model				
Fundamentals	- Introduction to IPv4 (Internet Protocol)				
	- IPv4 Packet Header				
	- Address Resolution Protocol (ARP)				
	- Introduction to TCP and UDP				
	- TCP Header				
	- Introduction to ICMP				
	- Introduction to DNS				
	- User mode and Privileged mode				
VLANs	- VLANs Basic				
	- How to configure VLANs				
Wireless	- Introduction to Wireless Networks				
	- Introduction to Wireless LANs				
	- Wireless LAN 802.11 Service Sets				
	- Introduction to Wireless Security				
	- Wireless Authentication Methods				
	- Wireless Encryption and Integrity				
	- Wi-Fi Protected Access (WPA)				
	- WLC WPA2 PSK Authentication				
IP Connectivity	- Introduction to Routers and Routing				
	- Router Basic Configuration				
	- Introduction to Wide Area Networks (WAN)				
IPv4 Subnetting	- Introduction to Subnetting				
	- Basics of Binary Numbers				
	- Subnetting in Binary, Decimal (Fast Method)				
	- Classless Inter-Domain Routing (CIDR)				
	- Variable Length Subnet Mask (VLSM)				
	- Route Summarization				
	- Hexadecimal to Binary and Decimal Conversion				
	- Create a Subnetting Cheat Sheet				
IPv6	- Introduction to IPv6				
	- Shortening IPv6 Addresses				
	- How to find IPv6 Prefix				
	- IPv6 Address Types				
	- IPv6 Address Assignment Example				
	- IPv6 Summarization				
Routing	- Default Gateway				
	- Static Routing				
	- IPv6 Static Route				
	- IP Routing Explained				
	- Router on a Stick				
	- InterVLAN Routing				

OSPF (OPEN	- Introduction to OSPF
SHORTEST PATH	- OSPF Configuration
FIRST)	- OSPF Packets and Neighbor Discovery
	- OSPF Reference Bandwidth
	- OSPF Router ID
DHCP (Dynamic	- Introduction to DHCP
Host	- DHCP Server Configuration
Configuration	- DHCP Relay Agent
Protocol)	- DHCP Client
	- DHCP Server IPv6 Configuration
SNMP	- Introduction to SNMP
NAT	- Introduction to NAT and PAT
	- NAT Static & Dynamic
	- Port Address Translation (PAT)
(QoS) Quality of	- Introduction to Quality of Service (QoS)
Service	- IP Precedence and DSCP Values
	- Classification
Automation and	- Device Programmability
Programmability	- REST API
	- Data Models and Structures
	- Introduction to Software-Defined Networking (SDN)
	- Spine and Leaf Architecture
Cloud Computing	- Virtual Machines and Containers
	- Introduction to Cloud Computing
	- Cloud Connectivity
Hardware and	- PC Components
Assembling	- Network Switch and Routers
	- Power supply
	- Rack maintenance
Additional Requir	ement:
Basic Web	- Knowledge of PHP, Asp.Net, JSP.
Technologies	- Knowledge of Databases (My SQL, Postgresql, MongoDB), SQL
	query
	- Connectivity of frontend to backend.
Productivity Tools	- MS Office or Other Office suites
	- Version Control Systems (Ex. Git)
	- Collaborative Tools (Slack, Overleaf, Microsoft Teams, etc.)
Support for online	- Knowledge of online meeting software
meetings/video	(e.g., Cisco WebEx, Microsoft Teams, Google Meet)
conferencing	- Troubleshoot issues related to audio, video, screen sharing, etc.
Technical	- Understanding and Creating UML/BPMN Documentation
Documentation	- Creating Technical Diagrams: Vector Diagrams such as EPS, SVG
	- Generate different charts from the data
	- Creation of Technical Presentations

Automation	Python & Shell Programming	
Through Scripting	- Variables and Data Types	
	- Control Flow	
	- Functions	
	- Lists and Dictionaries	
	- File Handling	
	Regex	
	- Literal Characters	
	- Metacharacters	
	- Character Classes	
	- Quantifiers	
	- Anchors and Boundaries	
	- Groups and Capturing	
	- Alternation	

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