

Contestant ID: \_\_\_\_\_

Time: \_\_\_\_\_

Rank: \_\_\_\_\_




# **LINUX OPERATING SYSTEM FUNDAMENTALS**

## **(350)**

## **REGIONAL 2026**

### **CONCEPT KNOWLEDGE:**

Multiple Choice (50 @ 2 points each)  \_\_\_\_\_ (100 points)

### **Test Time: 60 minutes**

**GENERAL GUIDELINES.**

Failure to follow any of these rules may result in disqualification:

1. **Submission Requirements:** Contestants must submit this test booklet along with any printouts.
2. **Permitted Items:** Only the equipment, supplies, and materials specified for this event are allowed in the testing area. Previous BPA tests and sample tests (whether handwritten, photocopied, or typed) are not permitted.
3. **Electronic Devices:** Electronic devices will be monitored according to ACT standards.

### Multiple Choice Questions

*Directions:* Identify the letter of choice that best completes the statement or answers the question.

1. You need to identify lines containing the word "error" in a large system log file located at /var/log/syslog. Which command would you use?
  - A. cat /var/log/syslog
  - B. grep "error" /var/log/syslog
  - C. tail /var/log/syslog
  - D. wc -l /var/log/syslog
2. You suspect a configuration file contains a repeated line. Which command helps you filter out duplicate lines to see unique entries only?
  - A. uniq
  - B. sort
  - C. head
  - D. split
3. A user reports that a specific word appears several times in a text file. Which of the following commands would you use to locate all instances of that word?
  - A. locate <word>
  - B. grep <word> file.txt
  - C. ls -R <word>
  - D. wc -l file.txt
4. After editing a text file, you want to compare it with its backup to see what's changed. Which command is best suited for this?
  - A. diff file.txt file.txt.bak
  - B. tail file.txt.bak
  - C. grep file.txt.bak file.txt
  - D. cat file.txt file.txt.bak
5. A script is failing because it cannot find a specific command. Which environment variable likely needs to be updated to include the command location?
  - A. HOME
  - B. LOGNAME
  - C. PATH
  - D. SHELL
6. You want to set an environment variable EDITOR to vi permanently for all users. Which configuration file is the best place to set this system-wide?
  - A. ~/.bashrc
  - B. /etc/profile
  - C. ~/.bash\_profile
  - D. /etc/hosts

7. You need a login shell to automatically run a script each time a user logs in. Which file should you edit in the user's home directory for Bash?
  - A. ~/.bash\_logout
  - B. /etc/bashrc
  - C. ~/.bash\_profile
  - D. /etc/crontab
8. You want to create an alias ll that lists files in long format with human-readable sizes. Which line would you add to your shell configuration file?
  - A. alias ll='ls -la'
  - B. alias ll='ls -l --color=auto'
  - C. alias ll='ls -lh'
  - D. alias ll='ls -lh --color=auto'
9. You're logged in as a regular user and need to gracefully shut down the system. Which command is correct?
  - A. shutdown -r now
  - B. sudo shutdown -h now
  - C. init 3
  - D. systemctl isolate multi-user.target
10. A service has stopped responding, and you want to restart only that service. Which systemd command should you use if the service name is apache2?
  - A. systemctl reboot apache2
  - B. systemctl enable apache2
  - C. systemctl start apache2
  - D. systemctl restart apache2
11. A user wants the system to enter single-user mode for maintenance. Which command typically triggers single-user mode (rescue mode)?
  - A. systemctl rescue
  - B. systemctl isolate multi-user.target
  - C. systemctl isolate graphical.target
  - D. systemctl set-default multi-user.target
12. After installing the Trivial File Transfer Protocol (TFTP) FTP server (service name ="tftp"), you want to ensure it starts on boot, which command helps configure that?
  - A. update-rc.d tftp defaults
  - B. systemctl enable tftp
  - C. chkconfig tftp on
  - D. service tftp enable
13. You need to install a package called tree. Which command should you use?
  - A. apt-get remove tree
  - B. apt-get install tree
  - C. prog load tree
  - D. zypper input tree

14. You need to update the package index without performing an upgrade. Which command achieves this?
- A. yum update
  - B. apt-get update
  - C. apt-get upgrade
  - D. check-update
15. A user complains that the wget command is missing. How do you install it?
- A. yum install wget
  - B. apt-get install wget
  - C. zypper remove wget
  - D. apt-get purge wget
16. You recently updated your system. Which command removes any unused packages or dependencies afterwards?
- A. clean all
  - B. apt-get autoremove
  - C. autoremove
  - D. remove remove-orphans
17. You need to add a repository before installing a new package. Which command is appropriate?
- A. addrepo <URL> <Alias>
  - B. apt-add-repository <URL>
  - C. dnf repolist
  - D. yum-config-manager add-repo <URL>
18. You need to format a new partition on /dev/sdb1 with the ext4 filesystem. Which command do you use?
- A. mkfs.ext4 /dev/sdb1
  - B. mkfs.xfs /dev/sdb1
  - C. ext4 /dev/sdb1
  - D. partition /dev/sdb1 ext4
19. You're mounting a new filesystem at /mnt/data temporarily. Which command would you typically use?
- A. mount /dev/sdb1 /mnt/data
  - B. mount /mnt/data /dev/sdb1
  - C. umount /mnt/data /dev/sdb1
  - D. umount /dev/sdb1 /mnt/data
20. A logical volume lv\_data in volume group vg\_main is out of space. You have added a new physical volume. Which command extends the logical volume?
- A. lvcreate -L +1G vg\_main/lv\_data
  - B. lvextend -L +1G /dev/vg\_main/lv\_data
  - C. vgcreate vg\_main /dev/sdc
  - D. pvcreate /dev/sdc

21. You want to check the disk space usage of each directory in /home. Which command is appropriate?
- A. `df -h /home`
  - B. `ls -lh /home`
  - C. `du -sh /home/*`
  - D. `fdisk -l /home`
22. You inserted a USB drive and want to see its device name under /dev. Which command helps identify newly attached block devices?
- A. `lsblk`
  - B. `lsusb`
  - C. `blkid -t USB`
  - D. `lvdisplay`
23. A user complains about a "permission denied" error on a file. You notice the permissions are `rw-r--r--` for owner, group, and others. Which command grants execute to owner?
- A. `chmod 755 file`
  - B. `chmod u+x file`
  - C. `chown user file`
  - D. `chgrp user file`
24. You need to create a symbolic link named shortcut pointing to /usr/local/bin/script.sh. Which command do you use?
- A. `ln shortcut /usr/local/bin/script.sh`
  - B. `ln /usr/local/bin/script.sh shortcut`
  - C. `ln -s /usr/local/bin/script.sh shortcut`
  - D. `link /usr/local/bin/script.sh shortcut`
25. A colleague needs read and write access to a folder you own, but not execute. Which numeric `chmod` value will achieve `rw-` for owner and group, and no permissions for others?
- A. 660
  - B. 770
  - C. 666
  - D. 700
26. You need to share files between two Linux systems. The requirements are to mount a remote file system over a network. Which protocol might you use?
- A. SMTP
  - B. NFS
  - C. HTTP
  - D. POP3
27. You have a printer configured on a Linux system and want to check its current queue. Which command is commonly used for this purpose?
- A. `lpstat -p`
  - B. `lp -d <printer>`
  - C. `lpoptions -d <printer>`
  - D. `lprm -P <printer>`

28. You need to assign an IP address manually to the network interface eth0. Which command could you use on a system using the ip utility?
- A. ip addr show eth0 192.168.1.10/24
  - B. ip link set eth0 up
  - C. ip addr add 192.168.1.10/24 dev eth0
  - D. ip route add 192.168.1.10/24 dev eth0
29. A new user named anna must be created on the system. Which command will be used?
- A. useradd anna
  - B. addusergroup anna
  - C. groupadd anna
  - D. passwd anna
30. The user alice needs membership in the developers group. Which command adds her to this existing group?
- A. usermod -a -G developers alice
  - B. groupadd developers alice
  - C. useradd -G developers alice
  - D. passwd alice developers
31. You need to remove a user bob and all of his home directory files. Which command accomplishes this?
- A. userdel bob
  - B. userdel -r bob
  - C. deluser bob
  - D. usermod -r bob
32. You suspect that the shadow file has incorrect permissions. Which directory path contains this file on a typical Linux system?
- A. /etc/security
  - B. /var/shadow
  - C. /etc/shadow
  - D. /usr/shadow
33. A user needs a new password. Which command allows you to set or change a user's password in Linux?
- A. passmod username
  - B. passwd username
  - C. pw user username
  - D. usermod -p username
34. You want to allow only members of the staff group to SSH into the server. Which file might you configure with AllowGroups staff to enforce this restriction?
- A. /etc/ssh/ssh\_config
  - B. /etc/ssh/sshd\_config
  - C. /home/staff/.ssh/config
  - D. /etc/hosts.allow

35. You are investigating suspicious logins. Which log file typically records SSH authentication attempts?
- A. /var/log/kern.log
  - B. /var/log/dmesg
  - C. /var/log/auth.log
  - D. /var/log/syslog
36. To prevent unauthorized SSH access, you decide to disable root logins. Where is the best place to make this change?
- A. /etc/shadow
  - B. /etc/hosts.deny
  - C. /etc/pam.d/sshd
  - D. /etc/ssh/sshd\_config
37. You notice an IPTables firewall rule blocking HTTP traffic. Which command shows the current active IPTables rules?
- A. iptables -L
  - B. ufw status
  - C. firewall-cmd --list-all
  - D. ip rule show
38. You need to open port 80 on a firewall-based system. Which command would you use?
- A. firewall-cmd --permanent --add-port=80/tcp
  - B. firewall-cmd --open-port=80
  - C. firewall --allow 80/tcp
  - D. systemctl open-port 80
39. You want to set a password policy requiring at least 8 characters. Which file typically contains PAM (Pluggable Authentication Module) password complexity rules?
- A. /etc/pam.d/system-auth
  - B. /etc/sudoers
  - C. /etc/services
  - D. /etc/bashrc
40. After a security audit, you decide to enable SELinux. Which command would set SELinux to enforcing mode immediately?
- A. setenforce 1
  - B. sestatus enforcing
  - C. echo SELINUX=enforcing >> /etc/selinux/config
  - D. selinux-config enforcing
41. You have installed AppArmor profiles. Which command loads a new AppArmor profile into the kernel?
- A. systemctl reload apparmor.service
  - B. apparmor\_parser -r <profile>
  - C. aa-add <profile>
  - D. aa-load <profile>



42. Your organization wants to track all sudo commands used by administrators. Which file typically logs sudo usage on many Linux distributions?
- A. /var/log/messages
  - B. /var/log/secure
  - C. /var/log/syslog
  - D. /var/log/sudo.log
43. You want to view kernel messages in real-time. Which command is best?
- A. dmesg -w
  - B. journalctl -k -f
  - C. journalctl -u kernel
  - D. cat /var/log/kern.log
44. Users are locked out after multiple failed login attempts. You suspect fail2ban is the cause. Which file typically contains fail2ban jail configurations?
- A. /etc/fail2ban/jail.local
  - B. /etc/fail2ban/jail.d/conf
  - C. /var/log/fail2ban.log
  - D. /usr/lib/fail2ban/jails/
45. A new developer needs to schedule a nightly job to run a script. Which file would you suggest editing for a user-specific cron job?
- A. /etc/cron.d/userjobs
  - B. /var/spool/cron/username
  - C. /home/username/.cronfile
  - D. /etc/cron.hourly/user
46. You're tasked with configuring a system to automatically lock the screen after 5 minutes of inactivity. Which utility manages user session inactivity?
- A. systemd-inhibit
  - B. XScreenSaver
  - C. pam\_unix\_session
  - D. logind.conf
47. A user complains they can't use sudo even though they're in the sudo group. Which file do you check to ensure the group name is recognized for sudo access?
- A. /etc/sudoers
  - B. /etc/shadow
  - C. /etc/login.defs
  - D. /etc/default/sudo
48. You want to view the top memory-consuming processes in real time. Which command do you run?
- A. ps aux --sort=-%mem
  - B. free -m
  - C. top
  - D. vmstat -m

49. After installing new software you want to verify its files. Which command can check if the package is installed and list its files?
- A. yum verify package
  - B. rpm -q package --filesbypkg
  - C. dnf files package
  - D. rpm --repair package
50. A developer wants a package that is not in the official repositories. What file can you edit to add a third-party repository?
- A. /etc/apt/sources.list
  - B. /etc/apt/preferences.d/extra.list
  - C. /usr/local/repo.conf
  - D. /etc/debian\_version