

(2 ½ Hours)

[Total Marks:75]

- N.B: (1) All questions are compulsory.  
 (2) Figures to the right indicate marks.  
 (3) Illustrations, in-depth answers and diagrams will be appreciated.  
 (4) Mixing of sub-questions is not allowed.  
 (5) Assume suitable data if needed.

**Q1. Attempt the following (any THREE): (15)**

- (A) What is the purpose of following shell environment variables:-  
 i. HOME  
 ii. PS1  
 iii. PS2  
 iv. SHELL  
 v. PATH
- (B) Explain the purpose the following commands:-  
 i. ps -ef  
 ii. df -h  
 iii. du -h  
 iv. bzip2  
 v. bzip2
- (C) How to create hard link and soft link in Linux system? Explain commands with syntax and examples.
- (D) Explain with the diagram User-Shell-Kernel relationship in Linux architecture?
- (E) Which are the two methods of traversing directories in Linux system?
- (F) Discuss Linux File System in detail.

**Q2. Attempt the following (any THREE): (15)**

- (A) What is the meaning of special parameter variables? Explain the purpose of \$#, \$\*, \$@, \${!#} special parameter variables with examples.
- (B) How to control the operation of loop in shell scripts? Explain.
- (C) Explain the following features used in advanced if-then statements with syntax and examples:-  
 i. double parentheses  
 ii. double brackets
- (D) How to perform math in shell scripts using expr, brackets [ ] and bc? Explain with examples.
- (E) What is purpose of /etc/passwd file? Explain entries present in it.
- (F) Give and explain the command with syntax and any four options to get input from user in shell scripts?

**Q3. Attempt the following (any THREE): (15)**

- (A) Write a short note on FTP.
- (B) How to trap and remove a signal using trap command? Explain with suitable example.
- (C) Define standard file descriptor. Explain the purpose of STDIN, STDOUT and STDERR with examples.

- (D) In sed editor, explain the use of action commands s, i, a, c, y with examples.
- (E) List any three features of awk command. Give the syntax of awk command with BEGIN and END section. Explain with one example.
- (F) List and explain any four Berkely r-utilities.

**Q4. Attempt the following (any THREE): (15)**

- (A) Define Firewall. Explain its three iptables.
- (B) List and explain any five system administrator duties.
- (C) What is file system? Explain its four components in detail.
- (D) Discuss startup and shutdown process in Linux system.
- (E) Write a note on fsck and its phases.
- (F) What is the purpose of /etc/fstab file? Explain its fields.

**Q5. Attempt the following (any THREE): (15)**

- (A) What are wild-card characters and its purpose? Give examples of all with ls command.
  - (B) How to change security settings of files and directories in Linux system using chmod command?
  - (C) What is the purpose of & symbol and nohup command in scripts? Give suitable example.
  - (D) Write a note on shutdown and sync operation.
  - (E) Explain the case structure command with syntax and an example.
  - (F) What is the use of tee utility and pipes ( | ) in Linux system. Explain with examples.
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