



## P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

**Fourth Semester, B.E. - Computer Science and Engineering**

**Semester End Examination; June - 2017**

**UNIX System Programming**

*Time: 3 hrs*

*Max. Marks: 100*

*Note: Answer FIVE full questions, selecting ONE full question from each unit.*

### UNIT - I

- |       |   |   |
|-------|---|---|
| 1. a. | Discuss the salient features of UNIX operating system.  | 8 |
|       | b. What are internal and external commands? Explain any two internal and any two external commands. | 8 |
|       | c. Distinguish between absolute pathname and relative pathname with examples.                       | 4 |
| 2. a. | Explain the UNIX architecture with a neat diagram.  | 8 |
|       | b. Explain the commands used in UNIX for changing, making and removing directories.                 | 6 |
|       | c. Explain the different file comparison commands available in UNIX.                                | 6 |

### UNIT - II

- |       |  |   |
|-------|--|---|
| 3. a. | Explain briefly the file attributes listed in the output of <i>ls -l</i> command.                          | 6 |
|       | b. What is inode? What are the contents of an inode record?  | 6 |
|       | c. What is sort command? Discuss its options with examples.  | 8 |
| 4. a. | What is process status? Explain <i>ps</i> command with options.  | 6 |
|       | b. Explain how file permissions can be changed in absolute and relative manner using <i>chmod</i> command. | 6 |
|       | c. Explain the following commands with examples :  |   |
|       | i) <i>head</i> ii) <i>cut</i>  | 8 |
|       | iii) <i>uniq</i> iv) <i>tr</i> .   |   |

### UNIT - III

- |       |   |   |
|-------|---|---|
| 5. a. | What are environment variables that control UNIX systems? Explain any five such variables.    | 8 |
|       | b. Discuss the significance of the following shell parameters :<br>\$#, \$0, \$? and \$!.     | 6 |
|       | c. What is <i>for</i> loop in a shell script? Explain the different ways of making the lists. | 6 |
| 6. a. | What is standard input, standard output and standard error? Explain with respect to UNIX.     | 6 |
|       | b. Explain with examples, the use of test and [ ] to evaluate expressions in shell.           | 8 |
|       | c. Explain trap in shell scripts with examples.   | 6 |

**UNIT - IV**

- 7 a. Explain the major differences between ANSI C and K & RC? 10
- b. Write a C/C++ POSIX compliant program that prints the POSIX defined configuration options supported on any given system using feature test macros. 10
- 8 a. Explain how file locking can be done using *fcntl* API? 10
- b. Explain the different symbolic link APIs. Write a C/C++ program to emulate the UNIX *ln* command. 10

**UNIT - V**

- 9 a. Explain the memory layout of a C program with neat diagrams. 8
- b. Write a C program that outputs the contents of its environment list. 4
- c. Explain the different *exec* functions with their prototypes. 8
- 10a. Explain with a neat diagram, the UNIX Kernel support for processes. 10
- b. What is race condition? Write a C/C++ program to illustrate race condition. 10

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