



Name :
Roll No. :
Invigilator's Signature :

**CS/MCA/SEM-5/MCAE-503A/2009-10
2009**

ADVANCED UNIX PROGRAMMING

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives of the following : $10 \times 1 = 10$
 - i) Where does the kernel store the read and write offsets for named pipe ?
 - a) File table
 - b) Inode
 - c) File descriptor table
 - d) None of these.
 - ii) The kernel never overwrites data in
 - a) regular file
 - b) directory
 - c) pipes
 - d) none of these.
 - iii) The state of the file system is contained in
 - a) inode block
 - b) boot block
 - c) superblock
 - d) data block.



- iv) Regarding storage allocation pipe uses
 - a) direct and indirect block
 - b) only direct block
 - c) inode block
 - d) superblock.

- v) A process can access its *U* area when it executes in
 - a) kernel mode
 - b) user mode
 - c) any of the mode
 - d) none of these.

- vi) The kernel handles signals only when a process returns from
 - a) user mode to kernel mode
 - b) kernel mode to user mode
 - c) region
 - d) none of these.

- vii) The kernel sends the signal to all processes whose real user *id* equals the effective user *id* of the sender when its *pid* is
 - a) positive integer
 - b) zero
 - c) negative integer, but not - 1
 - d) - 1.



viii) Which file is the initialization script file for Bourne shell in UNIX ?

- a) .profile
- b) .exrc
- c) .login
- d) .startup

ix) `expr "abcd.1239" : '.*'` displays

- a) 9
- b) abcd
- c) .1239
- d) none of these.

x) Swap partition is in UNIX

- a) use to swap files
- b) to use as virtual memory
- c) is mounted on /tmp
- d) swap two variables.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

- 2. a) Define context of a process. Write down the difference between context switch and change in mode for processes. 2 + 2
- b) Name the process whose *pid* is zero. 1

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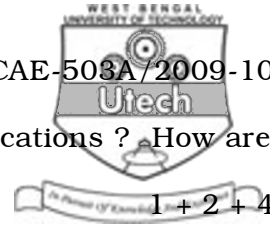
3. Describe with example, how system converts a pathname to an inode. 5
4. Describe swapping and demand paging and describe their advantages. 5
5. What is init process ? Describe all the init modes briefly. 5
6. What is interprocess communication in UNIX ? Describe with example. 5

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Draw a neat block diagram to represent the system kernel and describe the functions of various modules in it. 6
- b) Why do you need to run *X* clients in the background ? Which component of *X* is responsible for displaying a window on the screen ? What is the essential difference between these two commands ? $2 + 1 + 2$
- c) What information does a superblock contain ? Why is there a memory copy and a disk copy of inode block and superblock ? $2 + 2$



8. a) What is signal ? What are its classifications ? How are signals handled by the kernel ? 1 + 2 + 4
- b) What are sockets ? What are they used for ? 2 + 2
- c) What is select() and poll() ? What are their differences ? 2 + 2
9. a) Describe the blocks of a UNIX filesystem in briefly.
- b) What is inode number ? Describe with diagram, how UNIX use an inode to allocate disk blocks to store files.
- c) A UNIX file system has 32-bits address, 2048-bytes block size. The inode has 12 direct, one indirect and one double-indirect addresses. What is the maximum filesize it supports ? 5 + 6 + 4
10. a) Write a shell script to check whether a word is palindrome or not, the word should be supplied at command line.
- b) Write a shell script to read a temperatue in degree centigrade and converts it to degree Fahrenheit (upto 3 decimal places) and display it.



c) Write a shell script to display a pattern like below :

```
1
2 3
4 5 6
7 8 9 10                6 + 5 + 4
```

11. a) What do you mean by daemon ? How will you kill a daemon ? Which process cannot be killed by kill command ?
- b) What is the function of *exec* system call ? What is the difference between a process run with a '&' and run with *nohup* ?
- c) What is the default value of *umask* in UNIX ? What will be happened if we set value of *umask* as '066' ?
- d) What is the function of the touch command ? Describe briefly.
- e) What is the effect of the command 'touch temp' if the file temp does not exist ? 3 + 4 + 3 + 3 + 2



12. Write short notes on any *three* of the following : 3 × 5

- a) *umask* and *chmod*
- b) swapping strategy
- c) *for* and *while* loop structure
- d) *fork* system call
- e) *awk*
- f) *su* and *su romeo* (where romeo is a user account).

