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 × 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 × 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

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 × 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* ans *while* loop structure

d) *fork* system call

e) *awk*

f) *su* and *su romeo* (where romeo is a user account).