Name : …………………………………………………………

Roll No. : …………………………………………………………

Invigilator's Signature : ……………………………………

CS/BCA/SUPPLE/SEM-5/BCAE-501A/2010

2010
ADVANCED UNIX AND SHELL 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 for the following :   10 × 1 = 10

   i)   Stream socket provides a connection that is

      a)   sequenced and unreliable two-way byte stream

      b)   sequenced and reliable two-way byte stream

      c)   sequenced and unreliable one-way byte stream

      d)   sequenced and unreliable one-way byte stream.

   ii)   The PID of the kernel process is

      a)   0   b)   1

      c)   2   d)   3.

SE-4   [Turn over

iii) The number of 3's in the output of the following program

```
Main ()
{
  printf("1"); fork();
  printf("2"); fork();
  fork(); printf("1");
}
```
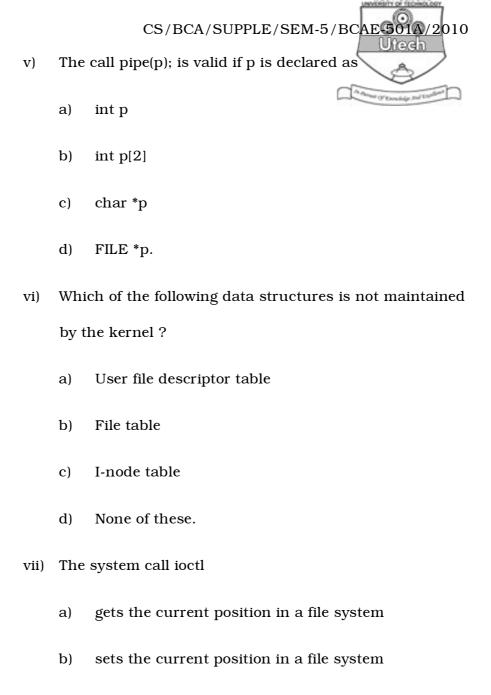
will be

a)   1   b)   2

c)   4   d)   8.

iv) The following program

```
Main ()
{
  if(fork()>0)
  sleep(100);
}
```

results in the creation of

a)   an orphan process

b)   a zombie process

c)   a process that executes forever

d)   none of these.
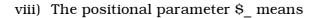
v) The call pipe(p); is valid if p is declared as

    a) int p

    b) int p[2]

    c) char *p

    d) FILE *p.

vi) Which of the following data structures is not maintained by the kernel ?

    a) User file descriptor table

    b) File table

    c) I-node table

    d) None of these.

vii) The system call ioctl

    a) gets the current position in a file system

    b) sets the current position in a file system

    c) passes control information to a device driver

    d) returns the current file offset in a system.

viii) The positional parameter $_ means

    a)   PID of the current shell

    b)   PID of last background process

    c)   Current shell settings

    d)   Total number of positional parameters.

ix) How will you kill the last background job without knowing its PID ?

    a)   kill –s KILL

    b)   kill –l

    c)   kill $!

    d)   kill $$.

x) If x has the value 10, what is the value of xx ?

    a)   10$10$ b)   1010

    c)   x10$ d)   1010$.

GROUP – B

(Short Answer Type Questions)

Answer *all* the questions.   3 × 5 = 15

2. Mention the significance of the shell parameters $?, $$, $!, $0, $#, $*. When the shell finds meta characters in the command line what does it do ?

Explain what these wild card patterns match :

a) [A –z] ????*

b) *[0 –9]*

c) *[! 0 –9]

d) *.[! s][! h]   2 + 1 + 2

3. A shell script stopped running when its name is changed. Why ? What is memory mapped I/O ?   2 + 3

4. Describe the two main functions of init. How does the kernel handle signal ? Why is the su command terminated with exit ?   2 + 2 + 1

GROUP – C

(Long Answer Type Questions)

Answer *all* the questions.   3 × 15 = 45

5.   a)   What is file descriptor ? What is the difference between the file descriptor table and file table ?

   b)   What are the advantages of executing a process in background ?

   c)   What is inode ? How does inode map to data block of a file ?

   d)   Write a C program using file related system calls to read a file in reverse order.

   e)   Explain the difference between system calls and library functions.   3 + 2 + 3 + 6 + 1

6.   a)   Explain briefly the relation between descriptor table, file table and vnode table.

   b)   What is boot block ?

   c)   What is semaphore ? How can Inter-process communication be implemented using semaphore ?

   d)   Why is signal unreliable ? What is special about SIGSTOP and SIGKILL signals ?   5 + 1 + 6 + 3

7. a) Write a shell program for bubble sorting.

   b) What are boot block and super block ?

   c) What are the significances of run level 0, 1, 2, 3, 4, 5 and 6 ?

   d) Develop a script logic that allows only Romeo and Henry to execute a program, and only from the terminals tty05 and tty06.

   e) Write a shell script to display the running process running on the system every 30 seconds for 3 times.

   $$4 + 2 + 3 + 3 + 3$$

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