Total No. of Questions :8]

SEAT No. :

P2282

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[5333]-2002
M.Sc.
COMPUTER SCIENCE
CS-202 : Advanced Operating System
(2013 Pattern) (Semester-II)

Time : 3 Hours] ***[Max. Marks : 50***

Instructions to the candidates:

1) ***Attempt any five questions.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***

Q1) a) Write a short note on context of process. **[4]**

b) Discuss the architecture of UNIX. **[4]**

c) Explain the syntax of open ( ) system call. **[2]**

Q2) a) Explain different types of memory regions found in every process. **[4]**

b) Explain the behaviour of following program **[4]**

```
# include <signal. h>
main ( )
{
    extern catcher ( );
    signal (SIGINT, catcher);
    kill (0, SIGINT)
}
catcher ( )
    {
    }
```

c) Explain any two thread functions. **[2]**

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Q3) a) Write a program to demonstrate use of atexit ( ) function. **[4]**

b) Describe the following signals. **[4]**

i) SIGTERM

ii) SIGABRT

iii) SIGSEGV

iv) SIGKILL

c) Write any two scheduler related system calls. **[2]**

Q4) a) In what situations window O.S. increases current priority value of threads? **[4]**

b) Write a 'C' program which opens a file and goes to sleep for 15 seconds before terminating. **[4]**

c) What are Daemons. **[2]**

Q5) a) Write a 'C' program to illustrate lseek ( ) system call. **[4]**

b) Depict the scenario of swapping out process. **[4]**

c) Justify-No process can preempt another process executing in the kernel. **[2]**

Q6) a) Explain the behaviour of following 'C' program. **[4]**

```
main ( )
{
    int fd;
    char but [1024];
    fd = create ("junk", 0666).
    lseek (fd, 20001, 2);
    write (fd, "hello", 5);
    close (fd);
    sd = open ("junk", O-RDONLY);
    read (fd, buf, 1024);
    read (fd, buf, 1024);
    read (fd, buf, 1024);
}
```

b) Explain the following system calls. **[4]**

i) sigaction ( )

ii) sigpending ( )

c) What is ACL? **[2]**

Q7) a) Write the advantages and disadvantages of mmap. **[5]**

b) Explain the behaviour of following 'C' program **[5]**

```
# include <signal. h>
main ( )
{
    register int i;
    setgrp ( );
    for (i = 0; i < 10; i ++)
    {
        if (fork ( ) = = 0)
        {    if (i & 1)
             setgrp ( );
        printf ("pid = % d pgrp = %d \n," getpid ( ), getpgrp ( ));
        pause ( );
        }
    }
    kill (0, SIGINT);
    }
```

Q8) a) Explain the scenario of process creation and process termination. **[5]**

b) Write a note on preemptive thread scheduling. **[5]**