Exam Slot → **C**

APJ Abdul Kalam Technological University
Second Semester M.Tech Degree Examination May 2016
Ernakulam II Cluster

COMPUTER SCIENCE AND ENGINEERING

Specialization : COMPUTER SCIENCE AND ENGINEERING

05CS 6006-OPERATING SYSTEM DESIGN CONCEPTS

Time: 3 Hours   Max Marks: 60

I a) Whether a buffer can exist on a hash queue and on free list simultaneously? Justify your answer.   (3 marks)

   b) Identify the major modules in Unix operating system and show their relationships to each other.   (9 marks)

II a) Consider the given program. What is the returned value for all reads and what is the content of the buffer. Describe what is happening in the kernel during each read?   (6 marks)

```
# including<fcntl.h>
    Main( )
    {       Int fd;
            Char buf[1024];
            fd = open ("Junk", 0-RDONLY);
            read( fd, buf, 1024);
            read(fd, buf, 100);
            read(fd, buf, 1024);
    }
```

   b) Suppose a process wants to access byte offset 350,000 in the file. Show how kernel access the corresponding block with the help of a diagram.   (6 marks)

III a) Whether a process can duplicate the region of another process? Justify your answer   (4 marks)

    b) Consider 3 process A,B and C. They are created in the given order A,B,C . Initial Priority of all three are given as 60, clock interrupts the system 60 times a second. Both process A & B are in one group and Process C is in another group. Show how the kernel schedules the processes for first 6 seconds using Fair Share Scheduler.   (14 marks)

                                            OR

IV   a)   How the kernel informs process of the occurrence of events? How Process reacts to it?   (12 marks)

     b)   How the shell could handle the following command? ls-a | wc   (6 marks)

V   a)   How kernel allocates swap space from Maps? Given that Initaial Swap Map starting at address 1 and consists of 10,000 blocks. Show the sequence of swap map configurations after allocating 100 units,150 units,100 units again. From the previous result show the sequence of swap map configurations after kernel frees 50 units of swap resource starting at address 101 and 100 units starting at 1.   (14 marks)

     b)   For the given page references 34,25,28,33,34,27,28,34,28 a process could make; Show the working set for window size 3.   (4 marks)

OR

VI   a)   How a process open a device? What is the purpose of no delay option?   (12 marks)

     b)   Identify the inter process communication mechanism in which processes share parts of their virtual address space.   (6 marks)