(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 7308 Roll No.

M.C.A.

(SEM. III) ODD SEMESTER THEORY EXAMINATION 2010-11

OPERATING SYSTEMS

Time : 3 Hours *Total Marks : 100*

Note :— Attempt **all** questions.

1. Attempt any **four** parts of the following :— **(5×4=20)**

   (a) Explain operating system. Discuss the various functions of an operating system.

   (b) Discuss the main purpose of system calls and system programs.

   (c) Differentiate between Batch processing and multiprogramming systems.

   (d) What is distributed system ? Discuss it.

   (e) Discuss the evolution of operating systems in brief.

   (f) Explain the following :—

      (i) Direct Memory Access

      (ii) Kernel.

2. Attempt any **two** parts of the following :— **(10×2=20)**

   (a) (i) What do you understand by a Process ? Discuss process state transition diagram.

      (ii) Discuss Process Control Block (PCB) in brief.

(b) Consider the following set of processes with the length of the CPU burst time given in milliseconds :—

Processes	Burst time
P_1	10
P_2	29
P_3	3
P_4	7
P_5	12

All five processes arrive at time O, in the order given, draw Gantt Charts illustrating the execution of the processes using FeFS, SJF and RR (quantum = 4) Scheduling. What turnaround time of each process for each of the Scheduling algorithms ? Also find the average waiting time for each algorithm.

(c) (i) Explain the term CPU Scheduling. Discuss the Scheduling objectives in brief.

(ii) Justify why each of the following is incorrect :—

(1) SJF is fair

(2) FIFO is an appropriate CPU.

scheduling scheme for interactive users.

Attempt any two parts of the following :— **(10×2=20)**

(a) (i) Define Deadlock and also discuss the four necessary conditions for a deadlock to exist. Give a brief intuitive argument for the reason each individual condition is necessary.

(ii) Explain Dijustra's Banker's Algorithm.

(b) Explain Semaphores. How can Semaphores be used to enforce mutual exclusion ? Give suitable example to explain.

(c) State Dining Philosopher Problem and discuss a solution of the same.

4. Attempt any **two** parts of the following :— **(10×2=20)**

(a) Discuss the following Storage Placement strategies with suitable examples :—

(i) Best Fit

(ii) First Fit

(iii) Worst Fit.

(b) Consider a process requesting to read from the following tracks :

98, 183, 37, 122, 14, 124, 65, 67

(i) Draw track chart for FCFS, SSTF, SCAN and C-SCAN algorithms of disk scheduling.

(ii) Determine total head movement in tracks in each case.

(iii) Which is the best algorithm ?

Assume if the disk head is initially at 53.

(c) Discuss the following in brief :—

(i) Virtual memory

(ii) Paging

(iii) Page fault

(iv) Locality.

5. **Write short notes on any TWO of the following :—**

(10×2=20)

(a) **Inter Process Communication**

(b) **File Systems**

(c) **Features of Windows NT.**