

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

PAPER ID : 7308

Roll No.

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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 0, 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 Dijkstra'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.