Or

10. Write short notes on any *three* of the following :

(i) Distributed systems

(ii) Clocks

(iii) Dining Philosopher's problem

(iv) Types of operating system

(v) PCB

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Total No. of Questions : 10] [Total No. of Printed Pages : 4

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MCA–201

M. C. A. (Second Semester) EXAMINATION, June, 2012

(Grading/Non-Grading)

OPERATING SYSTEM

(MCA – 201)

Time : Three Hours

Maximum Marks : $\begin{cases} GS : 70 \\ NGS : 100 \end{cases}$

Note : Attempt *one* question from each Unit. All questions carry equal marks.

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Unit – I

1. (a) Consider the following set of process :

Process	Arrival Time	Burst Time
P_1	0·0	8
P_2	0·4	4
P_3	1·0	1

Calculate average turnaround time using :

(i) FCFS

(ii) SJF (Non-pre-emptive)

(iii) SJF (Pre-emptive)

(b) Explain in brief the services provided by an operating system. Also explain in brief the characteristics of batch, interactive, time sharing and real time operating systems.

Or

2. (a) Define the *five* performance criteria used to judge the performance of CPU scheduling algorithms.

   (b) What is multiprogramming ? How does it affect the system performance with reference to memory and CPU scheduling ?

Unit – II

3. (a) Consider the following page-reference string :

   1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6

   How many page faults would occur for the following replacement algorithm assuming three frames ? All frames are initially empty, so first unique page will all cost one fault each :

   (i) FIFO replacement

   (ii) LRU replacement

   (iii) Optimal replacement

   (b) Discuss the advantages and disadvantages of contiguous allocation memory management scheme.

Or

(a) A machine has 48 bit virtual addresses and 32 bit physical address pages are 8 K. How many entries are needed for a conventional page table and for an invested page table ?

(b) Compare internal and external fragmentation.

Unit – III

5. (a) Write Banker's algorithm. What are the weaknesses of Banker's algorithm used for allocating resources to avoid the deadlock ?

(b) What is critical section problem ? How is it solved by semaphores ?

Or

6. (a) What is inter-process communication ? How is it achieved ?

   (b) Mention the mandatory conditions which should exist for a deadlock occur.

Unit – IV

7. (a) What are the various types of operation that can be performed on a file with examples ?

   (b) Suppose the head of a moving-head disk with 200 tracks, numbered 0 to 199, is currently serving a request at track 143 and has just finished a request at track 125. If the queue of request is kept in FIFO order :

   86, 147, 91, 177, 94, 150, 102, 175, 130

   What is the total head movement to satisfy these request for the following disk scheduling algorithm :

   FCFS, SSJF, SCAN

Or

8. (a) Discuss various methods of free space management in disk.

   (b) What are the goals of I/O softwares ?

Unit – V

9. (a) What is thread ? What [illegible] thread is created

   (b) Compare Windov[illegible]