MCA 3rd Semester Examination, 2010

O.S.

PAPER—CS/MCA/2305

Full Marks : 100

Time : 3 hours

Answer any **seven** questions

The figures in the right-hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

1. What is process ? What are the process state ? What is PCB ? What do you mean by CPU -bound process and I/O bound process ? What is context switching ? $2+2+2+2+2$

2. What is preemptive scheduling ? What is throughput ? Write Shortest Job First scheduling algorithm with example. What is starvation ? $2+2+4+2$

3. What is race condition ? What do you mean by semaphore ? What is thrashing ? How co-operating process exchange their data and information ?

$2 + 3 + 2 + 3$

4. What is deadlock ? Explain resource allocation graph. What is safe state ? Prove that all deadlocks are unsafe but not all unsafe state are deadlock.

$2 + 3 + 1 + 4$

5. (a) What is external fragmentation ?

(b) Given memory partitions of 100K, 500K, 300 K, 600 K (in order). How would each of the first-fit best-fit, worst-fit algorithms place processes of 212K, 417K, 112K, 426K (in order). Which process makes the most efficient use of memory ?

(c) What are the advantages and disadvantages of single contigious allocation ?

$3 + 4 + 1 + 2$

6. (a) What is page fault ?

(b) Calculate page fault for the following pages to be insert in Main memory using LRU page replacement algorithm and FIFO page replacement algorithm.

0, 1, 2, 3, 0, 1, 2, 3, 0, 1, 2, 3, 4, 5, 6, 7.

$$3 + 3\frac{1}{2} + 3\frac{1}{2}$$

7. Explain SSTF and SCAN disk scheduling algorithm. Explain sequential file access method.

$$4 + 4 + 2$$

8. What is swapping ? What is page and frame ? What do you mean by compaction ? What do you mean by dynamic loading and dynamic linking ?

$$2 + 1\frac{1}{2} + 1\frac{1}{2} + 2 + 3$$

9. (a) Consider the following snapshort of a system :

	Allocation ABC	Max ABC	Available ABC
P_0	010	753	332
P_1	200	322	
P_2	302	902	
P_3	211	222	
P_4	002	433	

    (*i*) What is the content of the matrix 'need' ?

    (*ii*) Is the system in a safe state ?

  (*b*) What do you mean by 'Hold and Wait' ?

$3 + 4 + 3$

10. Write short notes on : $2\frac{1}{2} \times 4$

    (*i*) Indexed allocation method of file

    (*ii*) Belady's anamoly

    (*iii*) RR CPU scheduling algorithm

    (*iv*) Critical section problem.

[*Internal Assessment* — 30 Marks]