2017

MCA

3rd Semester Examination

OPERATING SYSTEM

PAPER—MCA 305

Subject Code—32

Full Marks : 100

Time : 3 Hours

The figures in the right hand margin indicate full marks.

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

Illustrate the answers wherever necessary.

Answer Q. No. *1* and any *four* from the rest.

1. Answer any *five* questions : 5×2

   (a) Is there any difference between an Operating System and a kernel ? Justify.

   (b) What are the benefits of Operating System co-operating processes ?

   (c) State the advantage of multiprocessor system.

   (d) What is the use of inter process communication.

(e) What is a real time system ?

(f) What do you mean by turnaround time ?

(g) Define batch systems.

2. (a) What is a critical section problem ?

(b) Briefly explain the requirements that a solution to the critical solution problem must satisfy.

(c) Define entry section and exit section.

(d) What is dispatch latency ? 3+6+4+2

3. (a) What are the advantages of contiguons allocation ?

(b) Define logical address space and physical address space.

(c) Briefly explain the concept of paging. 3+4+8

4. (a) What is a deadlock ? State the necessary conditions for deadlock.

(b) Explain any one strategy for deadlock prevention.

(c) Differentiate between process and thread. 2+6+3+4

5. (a) Briefly explain short term, long term and medium term scheduler ?

(b) What is the use of fork and exec system calls ?

(c) State the difference between RPC and RPQ.

(d) What is the use of Job Queues, Ready Queues and device Queues ? 6+3+3+3

6. (a) What is a virtual memory ?

(b) Consider the following page reference string :

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

If the process is allocated four physical frame, how many page faults would occur, if page replacement are done using FIFO.

(c) Differentiate between external fragmentation and internal fragmentation.

(d) Consider the following snapshot of a system and answer the following :

Process	Allocation			Maximum			Available		
	R_1	R_2	R_3	R_1	R_2	R_3	R_1	R_2	R_3
P_1	0	1	0	7	5	3	3	3	2
P_2	2	0	0	3	2	2			
P_3	3	0	2	9	0	2			
P_4	2	1	1	2	2	2			
P_5	0	0	2	4	3	3			

(i) Find the content of NEED column.

(ii) Find whether the system is safe or not using Banker's algorithm.

(iii) If yes then give the safe sequence.

2+3+4+(2+3+1)

4. Write short notes (any *five*) : 5×3

(a) Demand Paging ;

(b) Segmentation ;

(c) Resource Allocation Graph ;

(d) Deadlock Avoidance ;

(e) Semaphore ;

(f) System Calls ;

(g) Operating System Structure (Microkernel).

[Internal Assessment : 30 Marks]