

Roll No .....

**MCA-201****MCA. II Semester Examination, June 2014****Operating System***Time : Three Hours**Maximum Marks : 70*

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.  
 ii) All parts of each question are to be attempted at one place.  
 iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.  
 iv) Except numericals, Derivation, Design and Drawing etc.

**Unit - I**

1. a) Describe the two general goal of an operating system. 2
- b) What is a process? What are the attributes of a process? 2
- c) What is the difference between preemptive and non preemptive scheduling? 3
- d) Define the essential properties of the following types of operating system. 7
  - i) Batch ii) Real time
  - iii) Time sharing iv) Distributed

**OR**

Consider the following set of processes. With the length of the CPU-burst time given in milliseconds:

Process	Burst time
P <sub>1</sub>	10
P <sub>2</sub>	29
P <sub>3</sub>	3
P <sub>4</sub>	7
P <sub>5</sub>	12

Answer the following :

- i) Draw the Gantt charts illustrating the execution of these processes using FcFS, SJF and RR (q = 10)
- ii) What is the waiting time of each processes for each of the scheduling algorithm in part (i).

**Unit - II**

2. a) Compare internal and external fragmentation. 2
- b) What is the advantages of demand paging? 2
- c) Discuss the difference between logical address space and physical address space. 3
- d) Consider the following reference string : 7
 

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

How many page faults would occur for the following replacement algorithms, assuming 3 frames?

- i) FIFO replacement ii) CRU replacement iii) Optimal replacement

**OR**

What is the cause of thrashing? How does the system detect thrashing? Once it detects thrashing, what can the system do to eliminate this problem?

### Unit - III

3. a) What is a critical region? How do they relate to controlling access to shared resources? 2
- b) What is producer consumer problem? Given an example of its occurrence in operating systems. 2
- c) What are four necessary conditions that are needed for deadlock can occur? 3
- d) A semaphore is a blocking synchronization primitive. Describe how they work with the aid of pseudo - code. 7

OR

Consider the following snapshot of a system :

	Allocation	Max	Available
	A B C	A B C	A B C
P <sub>0</sub>	0 1 0	7 5 3	3 3 2
P <sub>1</sub>	2 0 0	3 2 2	
P <sub>2</sub>	3 0 2	9 0 2	
P <sub>3</sub>	2 1 1	2 2 2	
P <sub>4</sub>	0 0 2	4 3 3	

Answer the following questions using the banker's algorithm :

- i) What is the content of the matrix need?
- ii) Is the system in a safe state?
- iii) If a request from process P<sub>1</sub> arrives for (1, 0, 2) can the request be granted immediately?

### Unit - IV

4. a) Discuss the various attributes of a file. 2
- b) Describe the approaches used in free space management. 2
- c) What is DMA? Briefly discuss. 3
- d) Discuss contiguous linked and indexed disk allocation methods. 7

OR

Suppose a disk drive has 200 cylinders, numbered 0 to 199. The drive is currently serving a request at cylinder 53 and the previous request was at cylinder 60.

The queue of pending requests in FIFO order is 98, 183, 37, 122, 14, 124, 65, 67.

Starting from the current head position, what is the total distance (in cylinders) that the disk are moves to satisfy all the pending requests for each of the following disk. Scheduling algorithms?

- i) FCFS    ii) SSTF    iii) SCAN

### Unit - V

5. a) What is the relationship between threads and processes? 2
- b) Discuss performance monitoring and evaluation in brief. 2
- c) Compare windows and linux operating system. 3
- d) What is distributed system? Discuss the advantages of distributed systems. 7

OR

Briefly describe the followings :

- i) Worms and viruses    ii) Threads