



**MCA DEGREE EXAMINATIONS: JUNE 2015**

(Regulation 2013)

Second Semester

**MASTER OF COMPUTER APPLICATIONS**

P13CAT204: Operating Systems

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 2 = 20 Marks)**

1. What is residential System Calls?
2. What is monitors?
3. Write the solution for critical section problem.
4. Differentiate Long term and Short term scheduler.
5. How to avoid race condition?
6. Write any two real time examples where deadlock situation occurs.
7. What is the purpose of paging system?
8. Under what circumstances do page fault occur?
9. List the different file access methods.
10. Which type of file allocation method is used for the following: When request for a group of blocks at a time, when request is done block by block gradually?

**Answer any FIVE Questions:-**

**PART B (5 x 16 = 80 Marks)**

**Q.No:11 is Compulsory**

11. For the following set of processes with the length of the CPU Burst Time given in milliseconds:

| Process | Burst Time | Arrival time |
|---------|------------|--------------|
| P1      | 8          | 0            |
| P2      | 4          | 4            |
| P3      | 5          | 6            |
| P4      | 1          | 8            |

- (i) Draw Gantt charts illustrating the execution of these processes using FCFS, SJF (8) and RR (Quantum =1) Scheduling.
- (ii) What is the average turnaround time and average waiting time of each process for (8) the above mentioned algorithms?

12. 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.

- (i) How many page faults would occur for the FIFO, Optimal, LRU (12) replacement algorithms by assuming frame size is 2 ?
- (ii) Justify which algorithm suits the above page reference string. (4)

13. Consider the following snapshot of a system.

|    | Allocation | Max     | Available |
|----|------------|---------|-----------|
|    | A B C D    | A B C D | A B C D   |
| P0 | 0 0 1 2    | 0 0 1 2 | 1 5 2 0   |
| P1 | 1 0 0 0    | 1 7 5 0 |           |
| P2 | 1 3 5 4    | 2 3 5 6 |           |
| P3 | 0 6 3 2    | 0 6 5 2 |           |
| P4 | 0 0 1 4    | 0 6 5 6 |           |

Answer the following questions using the Banker's algorithm: (6)

- (i). What is the content of need matrix? (10)
- (ii). Is the system is in a safe state? Justify the answer.

14. Consider a disk queue with requests for I/O to blocks on cylinders 98,183,37,122,14,124,65,67 .

The head disk is initially at cylinder 53. Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests, for each of the following disk scheduling algorithms?

FCFS

SSTF

SCAN

LOOK

15. a) Consider a system that supports the strategies of contiguous, linked and indexed (10) allocation. What criteria should be used in deciding which strategy is best utilized for a particular file?

- b) What is the purpose of free space management in file system? (6)
- 16. a) Compare the different types of operating systems. (8)
- b) How can we prevent the occurrence of the deadlock? (8)

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