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13MCA23

**Second Semester MCA Degree Examination, Dec.2016/Jan.2017**  
**Operating Systems**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions.**

- 1 a. With a neat diagram, explain how interrupts are handled. Write the steps involved in interrupt processing. (10 Marks)
- b. Briefly explain the following :  
 i) Multiprocessor    ii) Time sharing    iii) Real Time    iv) Distributed. (10 Marks)
- 2 a. What is an operating system? Explain briefly operating system services. (10 Marks)
- b. What is a system call? Explain different types of system calls. (10 Marks)
- 3 a. Describe briefly PCB. Explain 2 – state process model and 5 – state process model with neat diagram. (10 Marks)
- b. Differentiate between preemptive and non – preemptive scheduling. (04 Marks)
- c. Five processes arrive at time 0, in the order given, with the length of the CPU – burst time given in milliseconds

Process	P1	P2	P3	P4	P5
Burst time	10	29	3	7	12

Draw Gantt chart and calculate the average waiting time and average turnaround time for the given processes using Round Robin method. Time Quantum = 10ms. (06 Marks)

- 4 a. Define Mutual Exclusion. Explain hardware approaches to enforce mutual exclusion. (10 Marks)
- b. Explain the concept of messages with reference to message passing. (06 Marks)
- c. Explain briefly Readers writers problem. (04 Marks)
- 5 a. What is a Deadlock? What are the necessary conditions for a Deadlock? (06 Marks)
- b. What do you mean by Deadlock avoidance? Explain Banker's algorithm for deadlock avoidance. (10 Marks)
- c. Explain the different between the internal and external fragmentation. (04 Marks)
- 6 a. What is a page fault? What action does the operating system take when a page fault occurs? Explain with the diagram. (10 Marks)
- b. Consider the following page reference string.  
 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 in the case  
 i) FIFP    ii) Optimal    iii) LRU algorithms.  
 Assuming 3 frames. Note that initially all frames are empty. (10 Marks)
- 7 a. With the neat diagrams, explain the file allocation methods. (10 Marks)
- b. Explain the different file access methods. (06 Marks)
- c. Briefly write the different life attributes. (04 Marks)
- 8 a. Define disk scheduling. What are the disk scheduling methods available? Explain any four in detail with example. (10 Marks)
- b. Write short notes on the following :  
 i) Cache memory    ii) Levels of thread  
 iii) Thrashing    iv) Free space Management. (10 Marks)

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