

## Second Semester MCA Degree Examination, June/July 2016

### Operating Systems

Time: 3 hrs.

Max. Marks: 100

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

- 1 a. Explain different types of a processor register. (08 Marks)  
 b. Explain different types of interrupts. (04 Marks)  
 c. Write short notes on :  
 i) Hand-held systems  
 ii) Clustered systems. (08 Marks)

- 2 a. What is an operating system? Explain various services provided by an operating system. (10 Marks)  
 b. How system call works? Explain with a neat diagram. (10 Marks)

- 3 a. Define thread. Explain three multi-threading models with a diagram. (05 Marks)  
 b. Explain process states with a neat diagram. (05 Marks)  
 c. Consider the following set of process with the length of the CPU burst given in milli seconds. Draw the Gantt chart and find the average waiting time for the following algorithms. Assume that all the processes have arrived to the queue at the same time (OMS).

i) FCFS

Process	Burst Time
P <sub>2</sub>	3
P <sub>3</sub>	3
P <sub>1</sub>	24

ii) SJF (non-preemptive)

Process	Burst time
P <sub>1</sub>	6
P <sub>2</sub>	8
P <sub>3</sub>	7
P <sub>4</sub>	3

(10 Marks)

- 4 a. Describe "Test And Set" and "Swap" instructions and their use in synchronization of processes. (10 Marks)  
 b. Explain the solution of Readers-Writers problem using semaphores. (10 Marks)

- 5 a. Write and explain Banker's algorithm for deadlock avoidance. (10 Marks)  
 b. How can deadlocks be prevented? Describe them. (05 Marks)  
 c. Explain the deadlock detection algorithms for several instances of a resource. (05 Marks)

- 6 a. Explain with the help of supporting diagram, how TLB improves the performance of demand paging. (10 Marks)  
 b. How many page faults for the following algorithms using a given memory strings?

i) FIFO

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

(06 Marks)

- c. Explain swapping with a neat diagram. (04 Marks)

- 7 a. Explain various file operations. (08 Marks)
- b. Explain the following with respect to free space management.
- i) Linked list (06 Marks)
  - ii) Grouping. (06 Marks)
- c. Explain two level directory structures with a neat diagram. (06 Marks)
- 8 a. Write short notes on following :
- i) Host attached storage (10 Marks)
  - ii) Network attached storage. (10 Marks)
- b. Explain various process scheduling algorithms in Linux operating system. (10 Marks)

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