Code: 9F00204

MCA II Semester Supplementary Examinations June/July 2018

OPERATING SYSTEMS

(For students admitted in 2011 (LC), 2012, 2013, 2014, 2015 & 2016 only)

Time: 3 hours Max. Marks: 60

Answer any FIVE questions

All questions carry equal marks

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1 (a) Explain the purpose and importance of system calls and discuss the calls related to device management and communication in brief.

(b) Explain the layered structure of an operating system by giving typical operations and the objects that are operated in each layer.

2 Consider the following set of processes, with the length of the CPU burst given in milliseconds:

Process	Burst time	Priority
P_1	2	2
P_2	1	1
P_3	8	4
P_4	4	2
P_5	5	3

The processes are assumed to have arrived in the order P_1, P_2, P_3, P_4, P_5, all at time 0.

(a) Draw four Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, SJF, non-preemptive priority (a larger priority number implies a higher priority) and RR (quantum = 2).

(b) What is the turnaround time of each process for each of the scheduling algorithms in part a?

(c) What is the waiting time of each process for each of these scheduling algorithms?

(d) Which of the algorithms results in the minimum average waiting time (over all processes)?

3 (a) Describe the semaphore. How the semaphores help in the process synchronization?

(b) Draw the schematic view of monitors and model the solution for dining philosopher's problem.

4 Compare and contrast paging and segmentation. Explain the address translation schemes of these memory management schemes with neat sketch.

5 Explain advantages and disadvantages of following file allocation methods:

(a) Contiguous allocation.

(b) Linked allocation.

(c) Indexed allocation.

6 (a) Explain about the RAID structure in disk management with various RAID levels of organization in detail.

(b) Difference between stable storage and tertiary storage.

7 Consider a system consisting of m resources of the same type being shared by n processes only one at a time. Show that the system is deadlock free if the following condition hold:
(i) The maximum need of each process is between 1 and m resources.
(ii) The sum of all maximum need is less than m + n.
(iii) Why is deadlock state more critical than starvation? Describe resource allocation graph with a deadlock, with a cycle but no deadlock.

8 (a) Describe the details of cryptography and how to use in computer security with an example.

(b) Compare active attacks with passive attacks.