

B.Tech III Year I Semester (R13) Supplementary Examinations June 2017

OPERATING SYSTEMS

(Common to CSE and IT)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- Why system calls are needed?
 - What data structures are needed to implement context switch?
 - A CPU-scheduling algorithm determines an order for the execution of its scheduled processes. Given n processes to be scheduled on one processor, how many different schedules are possible? Give a formula in terms of n .
 - Can a thread ever be preempted by a clock interrupt? If so, under what circumstances? If not, why not?
 - What are the differences between paging and segmentation?
 - What necessary conditions can lead to a deadlock situation in a system?
 - Assume that each block of size 256 KB. Allocation method is used is contiguous allocation. Directory entry for the file is (File, Start:24, Length:16). Find the file size.
 - Assume that size of each block in a disk is 1MB, and bit vector is 0011110011110011110111100. Find the free space in the disk.
 - List the goals of protection.
 - Define man in the middle in security attacks.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 (a) What are the set of operating system services that provides functions that are helpful to the user?
- (b) In figure given below, three process states are shown. In theory, with three states, there could be six transitions, what are those two missing transitions. However, only four transitions are shown. Are there any circumstances in which either or both of the missing transitions might occur?

**OR**

- 3 (a) Explain the dual mode operation of operating system.
- (b) How parent and child relationship is created between processes? Explain how parent and child behave on its termination.

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UNIT – II

4 Servers can be designed to limit the number of open connections. For example, a server may wish to have only N socket connections at any point in time. As soon as N connections are made, the server will not accept another incoming connection until an existing connection is released. Explain how semaphores can be used by a server to limit the number of concurrent connections.

OR

5 Why is round robin algorithm considered better than first come first serve algorithm?

Take three processes that arrive at the same time in the following order and the time quantum is 2 ms.

Process	Burst Time
P1	10
P2	5
P3	2

Draw Gantt chart and calculate average turnaround and waiting time using Round Robin Scheduling Algorithm without Switching.

UNIT – III

6 A system has four processes and five resources. The current allocation and maximum needs are as follows:

	Allocated	Maximum	Available
Process A	1 0 2 1 1	1 1 2 1 3	0 0 x 1 1
Process B	2 0 1 1 0	2 2 2 1 0	
Process C	1 1 0 1 0	2 1 3 1 0	
Process D	1 1 1 1 0	1 1 2 2 1	

What is the smallest value of x for which the system is in a safe state?

OR

- 7 (a) What are the different methods of handling deadlock?
(b) Explain about FIFO, LRU page replacement algorithms with an example.

UNIT – IV

8 Write the principle of working of any five disk scheduling algorithms.

OR

- 9 (a) Briefly explain about Acyclic Graph Directory Structure.
(b) A UNIX file system has 1-KB blocks and 4-byte disk addresses. What is the maximum file size if i-node contain 10 direct entries, and one single, double, and triple indirect entry each?

UNIT – V

- 10 (a) Give a note on application I/O interface.
(b) Explain about access matrix in detail.

OR

- 11 (a) Define Access control. Explain revocation of Access rights.
(b) What is system security? Explain user authentication.
