

B.Tech III Year I Semester (R15) Regular & Supplementary Examinations November/December 2019

OPERATING SYSTEMS

(Common to CSE & EIE)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- Mention the functions of operating system.
 - What do you mean by System Call?
 - Define Turnaround time in reference to scheduling algorithms.
 - What is the importance of process synchronization?
 - Mention any two advantages of virtual memory.
 - Give the necessary conditions for deadlock to occur.
 - What is meant by Belady's anomaly?
 - Compare Swapping with Overlays.
 - List out the various goals of protection.
 - Define Logic Bomb.

PART – B

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

UNIT – I

- 2 (a) What is Inter Process Communication (IPC)? Describe the two basic models of IPC. Also explain various operations provided in IPC.
- (b) What is an operating system? Elucidate on the objectives and Services offered by the operating system.

OR

- 3 (a) Write a short note on the following terminologies associated with the operating system:
(i) Multiprogramming systems. (ii) Multitasking systems. (iii) Multiprocessor systems.
- (b) What is a process? Explain the importance of Process Control Block and also discuss on the various states (with neat sketch) involved in the process life cycle.

UNIT – II

- 4 (a) What is the critical section? What are the minimum requirements that should be satisfied by a solution to critical section problem?
- (b) Consider the following five processes, with the length of the CPU burst time given in milliseconds. Find Average Waiting Time and Turnaround time for given process using SJF Algorithm?

Process	Arrival Time (ms)	Burst Time (ms)
P1	0	5
P2	1	3
P3	2	1
P4	3	3
P5	4	5

OR

- 5 (a) Differentiate between User Level Threads and Kernel Level Threads.
- (b) What is semaphore? Explain its implementation as wait and signal for providing process synchronization?

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UNIT – III

- 6 (a) Explain Deadlock Detection scheme for Several Instances of a resource type with an example.
 (b) "Virtual memory gives the illusion that the system has much larger memory than actually available memory" - Justify this statement with proper reasoning. Also discuss on the Demand Paging mechanism that is commonly used to implement virtual memory.

OR

- 7 (a) Assume that a system consists of five jobs (J1, J2, J3, J4 and J5) and three resources (R1, R2 and R3). Resource type R1 has 10 instances, Resource type R2 has 5 instances and Resource type R3 has 7 instances. For the following snapshot of the system, find the need matrix and calculate the safe sequence by using Banker's algorithm. Check whether the system is in safe state or not?

Jobs	Allocation			Maximum			Available		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
J1	0	1	0	7	5	3	3	3	2
J2	2	0	0	3	2	2			
J3	3	0	1	9	0	2			
J4	2	1	1	2	2	2			
J5	0	0	2	4	3	3			

- (b) Explain Internal Fragmentation and External Fragmentation with a neat diagram. Also discuss on various mechanisms implemented to avoid both of them.

UNIT – IV

- 8 (a) Write a detailed note on various RAID levels.
 (b) Explain different directory implementation methods with neat sketches.

OR

- 9 (a) Illustrate with an example the process of file system mounting.
 (b) Describe any two disk scheduling algorithms.

UNIT – V

- 10 (a) Discuss in detail the process of transforming I/O requests to hardware operations.
 (b) What is cryptography? How cryptography will be considered as a security tool?

OR

- 11 (a) Explain the protection mechanism illustrating the use of protection domain and access control list.
 (b) Write a short note on the following:
 (i) Program Threats.
 (ii) User Authentication.
 (iii) Domains of Protection.
