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Roll No. :

322456(22)

B. E. (Fourth Semester) Examination, April-May ~~2020~~

2021

(New Scheme)

(CSE Branch)

OPERATING SYSTEM

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) of each question is compulsory and carries 2 marks. Attempt any two parts from (b), (c) and (d) which carry 7 marks each.

Unit-I

1. (a) Define Operating System.
(b) Explain Batch OS and Time Sharing OS in detail.

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- (c) Explain different Input Output trends.
 (d) Explain distributed computing trends with suitable examples.

Unit-II

2. (a) Define a Process.
 (b) Calculate the Avg. Waiting time for the given snapshot, if all the processes have arrived at time 0 to CPU, using : SJF, Round Robin and Priority scheduling algorithm (Time quantum = 1 ms).

Process	Burst time	Priority
P_1	8	4
P_2	6	1
P_3	1	2
P_4	9	2
P_5	3	3

- (c) What is Critical Section Problem? Explain Semaphores with an example.
 (d) Explain producer consumer problem with its solution.

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Unit-III

3. (a) Define Deadlock.
 (b) Explain the necessary conditions for the deadlock to occur. Also explain Resource Allocation Graph.
 (c) Consider the following snapshot of the system :

	Allocation	Max	Available
	ABCD	ABCD	ABCD
P_0	0 0 1 2	0 0 1 2	1 5 2 0
P_1	1 0 0 0	1 7 5 0	
P_2	1 3 5 4	2 3 5 6	
P_3	0 6 3 2	0 6 5 2	
P_4	0 0 1 4	0 6 5 6	

Answer the following using Banker's algorithm :

- (i) What is the content of NEED matrix?
 (ii) Is the system in a safe state?
 (iii) If a request from process P_1 arrives for (0, 4, 2, 0) can the request be granted immediately?

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PTO

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- (d) Explain briefly different options for breaking a deadlock.

Unit-IV

4. (a) Define Memory.
- (b) Explain the concept of Paging with segmentation.
- (c) Give memory partitions of 100 kb, 500 kb, 200 kb, 300 kb and 600 kb (in order), how would each of the first fit, best fit and worst fit algorithms place processes of 212 kb, 417 kb, 112 kb and 426 kb (in order)? Which algorithm makes the most efficient use of the memory?
- (d) Consider a reference string : 4, 7, 0, 7, 1, 0, 1, 2, 1, 2, 7, 1, 2. The number of frames in the memory is 3. Find out the number of page faults using : optimal, FIFO and LRU page replacement algorithm.

Unit-V

5. (a) Define a File.

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- (b) Write a brief note on UNIX os.
- (c) Explain the file organization and access mechanism in windows os.
- (d) Suppose that a disk drive has 5000 cylinders (0 to 4999). The drive is currently serving a cylinder 143, and the previous request was at 125. The queue of pending request in order is : 86, 1470, 913, 1174, 948, 1509, 1022, 1750, 130. Starting from the current position calculate the total head movement to satisfy the pending requests using : FCFS, SCAN and LOOK disc scheduling algorithm.