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322456(22)

B. E. (Fourth Semester) Examination, April-May 2019

(New Scheme)

(CSE Engg.)

OPERATING SYSTEM

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : *Part (a) of each question is compulsory. Attempt any* ***two*** *parts from (b), (c) and (d) of each question.*

Unit-I

1. (a) What is Parallel Computation? Describe in 50-70 words. 2

(b) List 5 services provided by OS. Explain how each

provides convenience to the users. Explain in which case it would be impossible for user level programs to provide these services. 7

(c) Explain OS as resource manager. 7

(d) Write a note on evolution of OS. 7

Unit-II

2. (a) Define Process. 2

(b) Describe Dining Philosopher problem with its possible solution. 7

(c) If the different jobs and their arrival time and burst time are given below. Find average waiting time using FCFS and preemptive SJF (SRTF). 7

Process time	Arrival time	Burst time
P_1	0	8
P_2	1	4
P_3	2	9
P_4	3	5

(d) Describe an algorithm which satisfies all the conditions of critical section problem and also prove how it satisfies all the conditions. 7

Unit-III

3. (a) Give any daily routine examples of deadlock. 2

(b) Explain Resource Allocation Graph Algorithm and give detailed feedback analysis of following problem with RAG.

A system has four processes P_1 through P_4 and two resource types R_1 and R_2. It has 2 units of R_1 and R_3 units of R_2.

Given that P_1 requests 2 units of R_2 and 1 unit of R_1; P_2 holds 2 units of R_1 and 1 units of R_2; P_3 holds 1 unit of R_2; P_4 requests 1 unit of R_1; Show the Resource Graph for this state of the system. Is the system in deadlock, and if so, which processes are involved? 7

(c) Discuss Banker's algorithm for deadlock avoidance with suitable example. 7

(d) Consider a system with 5 process P_1 through P_5 and 4 resource type A, B, C, D. Resource type A has 3 instances, B has 8 instances, C has 10 instances and D has 8 of instances. Suppose that at time T_0, the following snapshot of systems has been taken :

Process	Allocation	Max
	A B C D	A B C D
P_1	0 0 1 2	0 0 1 2
P_2	1 0 0 2	1 7 5 0
P_3	1 2 3 4	2 3 5 6
P_4	0 0 3 0	0 8 5 8
P_5	0 1 1 0	0 6 5 7

So answer the following questions using Banker's algorithm :

(i) What is the content of matrix need?

(ii) Is the system in a safe state?

(iii) If a request from process P_1 arrives for (1, 4, 3, 2) can the request be granted immediately. 7

Unit-IV

4. (a) What is a bare (base) machine? 2

(b) What are the page replacement algorithms? Explain any one page replacement algorithm with example. 7

(c) What is Segmentation? Explain virtual to physical address mapping in a segmented system with the help of a diagram. 7

(d) What is Thrashing? State the cause of thrashing. 7

Unit-V

5. (a) Define seek time and latency time. 2

(b) Considering an ordered disk queue with requests involving tracks 98, 183, 37, 22, 14, 124, 65 and 67. If the read/write head is initialy at track 53. What is the total distance that the disk arm moves to satisfy all the pending request for C-SCAN? 7

(c) What is a File? Write diferent file attributes and operations. 7

(d) Explain the concept of Virtual Machine and its benefits. 7