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322456(22)

B. E. (Fourth Semester) Examination, ~~2020~~
APR-MAY2022

(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 Time Sharing Operating System.   2

    (b)   What are the system components of an operating system? Explain them in brief.   7

(c) Explain the following in brief : 7

(i) Operating system services

(ii) Batch operating system

(iii) Multiprogrammed operating system

(d) Explain the layered architecture of operating system. 7

Unit-II

2. (a) What is Process? Draw the state transition diagram of a process state. 2

(b) What is Critical Section Problem? Give the solution for critical section problem. 7

(c) Explain Priority and Round Robin scheduling algorithm in detail. Implement these algorithm and find the average waiting time :
(Time quantum = $4\,\mu s$). 7

Process		Burst time		Priority
P_1	→	10	→	3
P_2	→	1	→	1
P_3	→	2	→	4
P_4	→	1	→	5
P_5	→	5	→	2

(d) What is Concurrency Control? Explain with clanical problem. 7

Unit-III

3. (a) List the four necessary conditions for the occurance of deadlock. Explain in short. 2

(b) What are the different methods for handling deadlock? Explain deadlock prevention in detail. 7

(c) Consider a system with 5 processes P_0 through P_4 and three resource types A, B and C. The following snapshot of the system has been taken :

	Allocation			Man			Available		
	A	B	C	A	B	C	A	B	C
P_0	0	1	0	7	5	3	3	3	2
P_1	2	0	0	3	2	2			
P_2	3	0	2	9	0	2			
P_3	2	1	1	2	2	2			
P_4	0	0	2	4	3	3			

(i) Find the need matrix.

(ii) Is the system safe? Explain. 7

(d) Explain deadlock detection and recovery in detail. 7

Unit-IV

4. (a) What is Trashing?   2

    (b) Describe segmentation and its implementation.   7

    (c) Explain the concept of demand paging with
         example.   7

    (d) Explain the following in brief :   7
         (i) Cache memory
         (ii) Virtual memory

Unit-V

5. (a) What is Buffering?   2

    (b) What is input/output buffering? Explain with their
         types.   7

    (c) Explain file organisation and its access mechanism. 7

    (d) Write short notes on :   7
         (i) File sharing
         (ii) File directories