Code No.: CS303PC

R20

H.T.No.

8 R

CMR ENGINEERING COLLEGE: : HYDERABAD UGC AUTONOMOUS

II-B.TECH-I-Semester End Examinations (Supply) – June - 2025 OPERATING SYSTEMS

(Common to CSE, IT, CSC, CSD & CSM)

[Time: 3 Hours] [Max. Marks: 70]

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

		PART-A	(20	Marks)			
1. a) b) c) d)	What are the services of an Operating System? What is a dispatcher process? Describe the differences between Preemptive Scheduling and Non-Preemptive						
e) f) g) h) i)	What are the necessary conditions to occur Deadlock? What is Internal Fragmentation? What do you mean by Thrashing? Enumerate different I/O ctl System Calls.						
2.a) b)	1 0 1						
3.	What are different types of Operating Systems? Explain them in detail.						
4.	Following is the snapshot of a CPU						
	Process P1 P2 P3 P4 P5	CPU Burst 75 40 25 20 45	Arrival Time 0 10 10 80 85				

Draw the Gantt chart and calculate the turnaround time and waiting time of the jobs for FCFS (First Come First Served), SJF (Shortest Job First), SRTF (Shortest Remaining Time First) and RR (Round Robin with time quantum 15) scheduling algorithms.

OR

5.a)	Explain the concept of Semaphores. Illustrate with example.	[5M]
b)	Explain Peterson solution for Critical Section problem.	[5M]

6.	Consider the	following snapsh	not of a system:	:	[10M]	
	Processes	Allocation	Max	Available		
		A B CD	A B CD	ABCD		
	P0	17 (17 (17 (17 (17 (17 (17 (17 (17 (17 (2100		
			선 경기 11 전 전	99		
,						
	ii) Is the sy	stem in a safe st	ate? Why?			
	iii) Is the s	stem currently d	leadlocked? Wl	ny or why not?		
			,	1		
	Similar		0	R		
				e Allocation graph.	[5M]	
,	, 1				[5M]	
٠,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				[01.1]	
8.					[10M]	
			, _, -, -, -, -, -, -	, , , , , , , , , , , , , , , , , , , ,		
	with thee he	inco.	Ο	R		
0 0)	What is Virt	ual Mamaru? Dis	_		[5M]	
,						
D)	Explain brief	iy about LRO Pa	ige Replacemen	it Algorithm.	[5M]	
) a)	Evoloin vorio	yya Filo A aaaga n	acthoda with au	itable avamples	[5]M]	
,	•			madie examples.	[5M]	
b)	Explain File	System architecti	ure.		[5M]	
			\mathbf{O}	R		
1 a)	Explain vario	ous File Allocation	n Methods		[5M]	
1.aj		as I no minocure	ii ivictiioas.			
b)	•			ectory Implementation.	[5M]	
	7.a) b)	Processes P0 P1 P2 P3 P4 Answer the f i) What is ii) Is the sy iii) Is the sy iii) Is the sy iv) Which granted 7.a) Explain Dead b) Write short n 8. Illustrate the use the refere with three fra 9.a) What is Virtu Explain brief 9.a) Explain raid Explain File	Processes Allocation A B CD P0 0012 P1 2000 P2 0034 P3 2345 P4 0332 Answer the following question i) What is the content of the ii) Is the system in a safe steriii) Is the system currently down iv) Which process, if any granted immediately? 7.a) Explain Deadlock Avoidance by Write short notes on Access Manual Manua	Processes Allocation Max A B CD A B CD P0 0012 0012 P1 2000 2750 P2 0034 6656 P3 2345 4356 P4 0332 0652 Answer the following questions using the ba i) What is the content of the matrix Need? ii) Is the system in a safe state? Why? iii) Is the system currently deadlocked? Whiv) Which process, if any, or may becongranted immediately? Olivial Explain Deadlock Avoidance using Resource by Write short notes on Access Matrix. B. Illustrate the page-replacement algorithms i) use the reference string 7, 0,1, 2, 0, 3, 0, 4, 2 with three frames. Olivial What is Virtual Memory? Discuss the benefit by Explain briefly about LRU Page Replacement constants. Explain various File Access methods with sure by Explain File System architecture.	Processes Allocation Max Available ABCD ABCD ABCD P0 0012 0012 2100 P1 2000 2750 P2 0034 6656 P3 2345 4356 P4 0332 0652 Answer the following questions using the banker's algorithm: i) What is the content of the matrix Need? ii) Is the system in a safe state? Why? iii) Is the system in a safe state? Why? iii) Is the system currently deadlocked? Why or why not? iv) Which process, if any, or may become deadlocked if this whole request is granted immediately? OR 7.a) Explain Deadlock Avoidance using Resource Allocation graph. Write short notes on Access Matrix. 8. Illustrate the page-replacement algorithms i) FIFO ii) Optimal Page Replacement use the reference string 7, 0,1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2,1, 2, 0, 1, 7, 0,1 for a Memory with three frames. OR 9.a) What is Virtual Memory? Discuss the benefits of Virtual Memory Technique. b) Explain briefly about LRU Page Replacement Algorithm. OA) Explain various File Access methods with suitable examples. Explain File System architecture. OR	