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No.

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CII1329

Operating Systems (New) (1080)

P. Pages : 3

Time : Three Hours

Max. Marks : 100

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Attempt **any two** questions from each unit.
5. Figures to the right indicate full marks.
6. Draw suitable diagrams wherever necessary.
7. Assume suitable data wherever required.

UNIT - I

1. a) i) Discuss RTOS with its need & types in brief. 5
ii) Explain system model of virtual machine with advantages & disadvantages. 5
- b) i) Explain the following O. S. components in brief : 5
 - 1) Protection system.
 - 2) Command interpreter.
- ii) Draw & discuss process state transition diagram. 5
- c) i) What is threading ? Discuss its advantages in brief. 5
ii) Discuss monolithic structure of O. S. 5

UNIT - II

2. a) Consider following snapshot of a system. 10

Process	A. T.	B. T.	Privity
P ₁	0	8	3
P ₂	1	6	5
P ₃	2	1	2
P ₄	3	4	1
P ₅	4	2	4

Draw Gantt chart & Calculate average T.T.

and W. T. using following algorithms.

- i) SJF non preemptive
- ii) SJF preemptive
- iii) Priority based non preemptive
- iv) Priority based preemptive.

Assume lower the number, higher its priority.

- b) i) Draw & explain queuing diagram. 5
- ii) Explain 'mutual exclusion with busy waiting.' 5
- c) i) Explain highest response ratio next (HRN) algorithm in brief. 5
- ii) Discuss interrupt enabling & disabling as a solution for critical section problem. 5

UNIT - III

- 3. a) i) Define dead lock? Explain process termination in context of recovery from deadlock. 5
- ii) Discuss paging hardware with TLB. 5
- b) i) Explain 'Process table entry' & 'u-area' in brief. 5
- ii) What are types of fragmentation? List solutions for each of them. 5
- c) Consider following snapshot of a system. 10

	Allocaton	Maximum	Need	Available
P ₀	0 0 1 2	1 0 1 2	1 0 0 0	2 3 1 1
P ₁	0 0 0 1	1 5 3 2	1 5 3 1	
P ₂	0 4 3 4	2 6 5 6	2 2 2 2	
P ₃	1 7 5 2	2 7 5 4	1 0 0 2	
P ₄	0 0 1 4	0 0 2 6	0 0 1 2	

- i) Calculate the need matrix ?
- ii) Is the system in safe state ? If yes write the sequence.

UNIT - IV

4. a) i) Write a short note on virtual memory. 5
ii) Discuss demand paging in Unix. 5
- b) i) Explain indexing as a method of disk space allocation. 5
ii) Compare worms & trojan horses. 5
- c) Consider the following page reference string
7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1
How many page fault will occur for following page replacement algorithm
using 3 & 4 frames.
i) FIFO
ii) LRU 10

UNIT - V

5. a) Write short note on : 10
i) Inode
ii) Swap space management.
- b) Discuss structure of regular file in Unix. 10
- c) Explain :
i) Design issues of distributed OS. 5
ii) SSTF Scheduling. 5
