U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E. **Semester: V**

Branch: Electronics & Telecommunication Engineering **Duration: 3 hrs.**

Course Code: 19ET5PE2OS **Max Marks: 100**

Course: OPERATING SYSTEM

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

				CO	PO	Marks
			UNIT - I			
1	a)		With neat diagram explain batch processing system and turnaround time.	CO 1		**07**
	b)		Explain real time operating system with its types	CO 1		**06**
	c)		Explain three techniques of distributed operating system	CO 1		**07**
			OR			
2	a)		Explain round robin scheduling with time slice with a diagram in time sharing system	CO 1		**06**
	b)		With diagram explain multiprogramming system	CO 1		**07**
	c)		Define resource allocation. Explain the two popular strategies for resource allocation	CO 1		**07**
			UNIT - II			
3	a)		With diagram explain kernel level and user level thread	CO 1		**10**
	b)		Consider the following processes apply Highest Response Ration Next (HRN). Verify the condition for scheduling these processes. Calculate mean weighted turnaround and mean turnaround time plot the timing chart	CO2	PO1	**10**

Process	P1	P2	P3	P4	P5	P6	P7
Arrival time (sec)	0	2	2	4	5	6	8
Service time (sec)	4	3	2	5	3	2	3

			OR				
4	a)		With state diagram explain different state of a process	CO 1		**05**

<table>
<tr><td></td><td></td><td>b)</td><td>Consider the following processes apply Round Robin scheduling policy with δ = 2sec. Calculate mean turn-around time and Mean Weighted turn-around time and plot it
<table>
<tr><td>Process</td><td>P1</td><td>P2</td><td>P3</td><td>P4</td><td>P5</td><td>P6</td></tr>
<tr><td>Arrival time (sec)</td><td>0</td><td>0</td><td>2</td><td>3</td><td>5</td><td>6</td></tr>
<tr><td>Service time (sec)</td><td>7</td><td>5</td><td>4</td><td>2</td><td>3</td><td>1</td></tr>
</table></td><td>CO2</td><td>PO1</td><td>10</td></tr>
<tr><td></td><td></td><td>c)</td><td>With diagram explain fields of Process Control Block (PCB)</td><td>CO 1</td><td></td><td>05</td></tr>
<tr><td></td><td></td><td></td><td>UNIT - III</td><td></td><td></td><td></td></tr>
<tr><td></td><td>5</td><td>a)</td><td>With a neat diagram and an example explain stack and heap allocation</td><td>CO 1</td><td></td><td>10</td></tr>
<tr><td></td><td></td><td>b)</td><td>For the given page reference string and reference time strings use that First In First Out (FIFO) page replacement policy to verify whether it exhibits stack property for allocation n= 3 and m=4, Justify the answer with relevant information

Page reference string: 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,
Reference time string: t1, t2, t3, t4, t5, t6, t7, t8, t9, t10, t11, t12,t13,14,t15,t16</td><td>CO2</td><td>PO1</td><td>10</td></tr>
<tr><td></td><td></td><td></td><td>OR</td><td></td><td></td><td></td></tr>
<tr><td></td><td>6</td><td>a)</td><td>Explain with a neat diagram Buddy system and power 2-allocation</td><td>CO 1</td><td></td><td>07</td></tr>
<tr><td></td><td></td><td>b)</td><td>Explain the following
i) Page-in and Page-out operation
ii) Page fault
iii) Fields in a page table entry</td><td>CO 1</td><td></td><td>07</td></tr>
<tr><td></td><td></td><td>c)</td><td>Define Virtual memory and explain paged virtual memory system</td><td>CO 1</td><td></td><td>06</td></tr>
<tr><td></td><td></td><td></td><td>UNIT - IV</td><td></td><td></td><td></td></tr>
<tr><td></td><td>7</td><td>a)</td><td>A system contains four processes P1, P2, P3, P4, P5 and 10, 5, 7 resource units of resource classes R1, R2, R3. The allocation state of the system is (7, 2, 5). Process P1 has made request (1, 0, 2). Check whether request is safe and feasible.
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<table>
<tr><td></td><td>R1</td><td>R2</td><td>R3</td><td></td><td></td><td>R1</td><td>R2</td><td>R3</td></tr>
<tr><td>P1</td><td>7</td><td>5</td><td>3</td><td></td><td>P1</td><td>0</td><td>1</td><td>0</td></tr>
<tr><td>P2</td><td>3</td><td>2</td><td>2</td><td></td><td>P2</td><td>2</td><td>0</td><td>0</td></tr>
<tr><td>P3</td><td>9</td><td>0</td><td>2</td><td></td><td>P3</td><td>3</td><td>0</td><td>2</td></tr>
<tr><td>P4</td><td>2</td><td>2</td><td>2</td><td></td><td>P4</td><td>2</td><td>1</td><td>1</td></tr>
<tr><td>P5</td><td>4</td><td>3</td><td>3</td><td></td><td>P5</td><td>0</td><td>0</td><td>2</td></tr>
<tr><td colspan="4">Max_Need</td><td></td><td colspan="4">Allocated State</td></tr>
</table></td><td>CO2</td><td>PO1</td><td>06</td></tr>
<tr><td></td><td></td><td>b)</td><td>Explain the exception conditions in message passing</td><td>CO 1</td><td></td><td>06</td></tr>
<tr><td></td><td></td><td>c)</td><td>Write an algorithm for kernel actions in message passing using symmetric naming and blocking send</td><td>CO 1</td><td></td><td>08</td></tr>
</table>

			OR			
	8	a)	Explain with diagram deadlock prevention methods	*CO 1*		**10**
		b)	A system contains four processes P1, P2, P3, P4 and 6,4,8,5 resource units of resource classes R1, R2, R3, and R4. The allocation state of the system is (5, 3, 5, 4). Process P2 has made request (0, 1, 1, 0). Use Banker's algorithm to Check whether request is safe.	*CO2*	*PO1*	**10**
			UNIT - V			
	9	a)	With diagram explain two level directory structure	*CO 1*		**06**
		b)	Explain with diagram linked allocation	*CO 1*		**06**
		c)	Explain file system action at open system call	*CO 1*		**08**
			OR			
	10	a)	Explain file system action at close system call	*CO 1*		**07**
		b)	Explain with diagram multilevel indexed allocation	*CO 1*		**07**
		c)	With diagram explain mounting of file system with an example	*CO 1*		**06**

	R1	R2	R3	R4
P1	2	1	2	1
P2	2	4	3	2
P3	5	4	2	2
P4	0	3	4	1
Max				

	R1	R2	R3	R4
P1	1	1	1	1
P2	2	0	1	0
P3	2	0	2	2
P4	0	2	1	1
Allocation				

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