FINAL SCHEME

02000CST206052102

			Total Pages: 3

Scheme of Valuation/Answer Key

(Scheme of evaluation (marks in brackets) and answers of problems/key)

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FOURTH SEMESTER B.TECH DEGREE **(S)** EXAMINATION, JUNE **2023 (2019 SCHEME)**

Course Code: CST 206

Course Name: OPERATING SYSTEMS

Max. Marks: 100		Duration: 3 Hours

PART A

		(Answer all questions; each question carries 3 marks)	Marks
1		Operations during system call – 3 marks	3
2		Multiprocessor system(1)+ Any two advantages (2)	3
3		Difference between process & thread – 3 marks	3
4		Message passing (1.5) + Shared memory(1.5)	3
5		Mutual exclusion, progress and bounded wait, each carry 1 mark	3
6		Priority inheritance protocol – 3 marks **Full credits may be given if attempted**	3
7		Internal – 1.5 marks + external fragmentation – 1.5 marks	3
8		Demand paging - 3marks	3
9		Linked allocation (1) + Merits (1) + Demerit(1)	3
10		C-SCAN – 1.5 marks + C-LOOK – 1.5 marks	3

PART B

(Answer one full question from each module, each question carries 14 marks)

Module -1

11	a)	Explaining each carry 2.5 marks (2.5x4) **Full credits may be given if attempted**	10
	b)	Layered approach with figure	4
12	a)	Any 4 kernel data structures with example (2x4) Stack, queue, list, tree, bitmap, hash table	8

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		Full credits may be given if attempted	
	b)	Justification as government (2) + resource allocator(2) + control program(2)	6
		Module -2	
13	a)	Fig – 2 mark + Explanation of Operations – 5 marks	7
	b)	Direct communication – 3.5 marks + indirect communication – 3.5 marks	7
14	a)	Drawing Gantt chart (1 mark) + Finding the average waiting time (2 mark) . 3 marks for each scheduling i) FCFS – 3.75 (ii) SJF – 3.5 (iii) SRTF – 3.25	9
	b)	Explanation **Full credits may be given if attempted**	5
		Module -3	
15	a)	Solution using banker's algorithm. Need matrix – 2 marks, Available matrix(3,3,2,0) - 1 mark Steps showing solution – 4 marks Order of processing (Safe Sequence): <P4, P3, P1, P2> – 1 marks.	8
	b)	Explanation of problem (2 marks) + solution using semaphore (4 marks)	6
16	a)	Dining philosopher's problem (2 marks) and give a solution using semaphore (4 marks) and structure of philosopher. (2 marks)	8
	b)	Breaking the conditions for deadlock Mutual exclusion – 1.5 Hold and wait – 1.5 No preemption -1.5 circular wait – 1.5	6
		Module -4	
17	a)	i) LRU-10 faults ii) FIFO-14 faults iii) Optimal-8 faults, each of these steps showing faults carry 3 marks	9
	b)	Shared pages – Diagram – 2 marks + Explanation – 3 marks	5

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<table>
<tr><td>18</td><td>a)</td><td>Diagram of each allotting the process- 2 marks (2*3=6 marks)
Best fit is the best algorithm – 2 marks</td><td>8</td></tr>
<tr><td></td><td>b)</td><td>Hashed page table – diagram -2 marks + explanation – 4 marks.</td><td>6</td></tr>
<tr><td colspan="4">Module -5</td></tr>
<tr><td>19</td><td>a)</td><td>Explanation on FCFS (3 marks), SSTF (3 marks) and SCAN (3 marks) disk scheduling algorithms using the given disk queue of request.
FCFS : 410
SSTF : 262 (100->89->130->180->45->20)
SCAN : 278 (for the head moving towards cylinder no 199)
100->130->180->199->89->45->20
SCAN : 280 (for the head moving towards cylinder 0 initially)
100->89->45->20->0->130->180</td><td>9</td></tr>
<tr><td></td><td>b)</td><td>Bit vector – 2marks, Linked list – 2 marks , First free block keeps the address of n-1 free blcks – 1 mark</td><td>5</td></tr>
<tr><td>20</td><td>a)</td><td>Access matrix - 7 marks
<table>
<tr><td></td><td>F1</td><td>F2</td><td>F3</td><td>F4</td><td>D1</td><td>D2</td><td>D3</td><td>D4</td></tr>
<tr><td>D1</td><td>R, W</td><td></td><td>R, W</td><td>R, W</td><td></td><td>S</td><td></td><td>S</td></tr>
<tr><td>D2</td><td>R</td><td></td><td></td><td>X</td><td></td><td></td><td></td><td></td></tr>
<tr><td>D3</td><td>R</td><td></td><td></td><td>X</td><td></td><td></td><td></td><td></td></tr>
<tr><td>D4</td><td>R</td><td>X</td><td>R, W</td><td></td><td></td><td></td><td>S</td><td></td></tr>
</table></td><td>7</td></tr>
<tr><td></td><td>b)</td><td>Low level formatting – 2.5, partitioning – 2 mark, logical formatting – 2.5</td><td>7</td></tr>
<tr><td></td><td></td><td>***</td><td></td></tr>
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