Model Question Paper-1/2 with effect from 2022-23 (CBCS Scheme)

USN | | | | | | | | | | |

Fourth Semester B.E. Degree Examination

Operating System

TIME: 03 Hours **Max. Marks: 100**

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

		Module -1	*Bloom's Taxonomy Level	Marks
Q.01	a	What is an Operating system and explain its Goals?	L2	4M
	b	List and describe the various architectural supports required and techniques used for improving the performance in multiprogramming O.S.	L2	8M
	c	Apply the memory management technique used to manage the memory efficiently in time sharing O.S.	L3	8M
		OR		
Q.02	a	List the operations of an O.S.	L2	4M
	b	List and explain the various classes of Operating System w.r.t. key features and prime concerns.	L3	8M
	c	Classify Real time O.S on the basis of their performance and applications also explain with example.	L3	8M
		Module-2		
Q. 03	a	What are the various components of process environment?	L2	4M
	b	What are the fundamental process states? With state transition diagram explain state transition for a process.	L3	8M
	c	Analyze the performance of Operating system for the set of processes given in below table using FCFS non-preemptive scheduling policy. Process | P1 | P2 | P3 | P4 | P5 Arrival time | 0 | 2 | 3 | 5 | 9 Service time | 3 | 3 | 2 | 5 | 3	L4	8M
		OR		
Q.04	a	What is thread? Mention its advantages.	L2	4M
	b	Explain the various fields of PCB and explain the importance of each field.	L3	8M
	c	Analyze the performance of Operating system for the set of processes given in below table by applying RR preemptive scheduling policy. Process | P1 | P2 | P3 | P4 | P5 Arrival time | 0 | 2 | 3 | 5 | 9 Service time | 3 | 3 | 2 | 5 | 3	L4	8M
		Module-3		
Q. 05	a	Compare contiguous and noncontiguous memory allocation and explain in brief how to implement noncontiguous memory allocation.	L3	10M
	b	Explain with diagram i)Paging ii)Segmentation	L3	10M
		OR		
Q. 06	a	With neat diagram explain the concepts of operation of demand paging.	L3	10M
	b	Find the number of page faults for the following page reference string using FIFO and LRU policies with four free frames. Which algorithm	L3	10M

		gives the minimum number of page faults? 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1		
		Module-4		
Q. 07	a	List and explain the actions performed by file system at open with its AFT.	L2	6M
	b	List and explain the facilities provided by the file system and the IOCS with layer diagram.	L2	6M
	c	With diagram explain the Linked disk space allocation method and list their advantages and disadvantages.	L3	8M
		OR		
Q. 08	a	Identify various file operations performed by file system.	L3	6M
	b	Explain file organization in sequential and direct access methods and compare their performance.	L3	6M
	c	Explain the indexed disk space allocation method and list their advantages and disadvantages.	L3	8M
		Module-5		
Q. 09	a	List the approaches used for handling deadlock, and explain in detail.	L2	10M
	c	Illustrate how to implement message passing. And discuss the primary issues in implementing message passing	L3	10M
		OR		
Q. 10	a	Describe the various events related to resource allocation and the condition for deadlock to exist.	L3	10M
	b	Explain i) Direct and indirect naming in message passing. ii) Blocking and non-blocking sends in message passing.	L3	10M

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<table>
<tr><th colspan="3">Module -1</th><th>*Bloom's Taxonomy Level</th><th>Marks</th></tr>
<tr><td>Q.01</td><td>a</td><td>Mention and explain the operations of Operating system</td><td>L1</td><td>4M</td></tr>
<tr><td></td><td>b</td><td>Explain the various resource allocation techniques used for resources allocation.</td><td>L2</td><td>8M</td></tr>
<tr><td></td><td>c</td><td>Explain Batch processing operating system with diagram and define turnaround time.</td><td>L3</td><td>8M</td></tr>
<tr><td colspan="3">OR</td><td></td><td></td></tr>
<tr><td>Q.02</td><td>a</td><td>Explain the features of Real time operating system.</td><td>L2</td><td>4M</td></tr>
<tr><td></td><td>b</td><td>Describe the working principle of time sharing O.S. and define response time.</td><td>L3</td><td>8M</td></tr>
<tr><td></td><td>c</td><td>Explain various techniques used in multiprogramming to improve throughput of system.</td><td>L3</td><td>8M</td></tr>
<tr><td colspan="3">Module-2</td><td></td><td></td></tr>
<tr><td>Q. 03</td><td>a</td><td>What are the various components of process environment?</td><td>L2</td><td>4M</td></tr>
<tr><td></td><td>b</td><td>Explain in detail the O.S view of processes.</td><td>L3</td><td>6M</td></tr>
<tr><td></td><td>c</td><td>Analyze the performance of Operating system for the set of processes given in below table using FCFS & SRN non-preemptive scheduling policy.
<table>
<tr><td>Process</td><td>P1</td><td>P2</td><td>P3</td><td>P4</td><td>P5</td></tr>
<tr><td>Arrival time</td><td>0</td><td>2</td><td>3</td><td>5</td><td>9</td></tr>
<tr><td>Service time</td><td>3</td><td>3</td><td>2</td><td>5</td><td>3</td></tr>
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<tr><td>Q.04</td><td>a</td><td>What is Thread and mention its advantages.</td><td>L2</td><td>4M</td></tr>
<tr><td></td><td>b</td><td>Describe with diagram i)kernel level threads and user level threads.</td><td>L3</td><td>6M</td></tr>
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<tr><td>Q. 05</td><td>a</td><td>Explain virtual memory handler with the help of diagram.</td><td>L3</td><td>8M</td></tr>
<tr><td></td><td>b</td><td>Explain with diagram i) Internal Fragmentation ii)External Fragmentation iii)Paging iv)Segmentation</td><td>L3</td><td>12M</td></tr>
<tr><td colspan="3">OR</td><td></td><td></td></tr>
<tr><td>Q. 06</td><td>a</td><td>With neat diagram explain the concepts involved in demand loading of a page.</td><td>L3</td><td>8M</td></tr>
</table>

	b	Determine the number of page faults for the following page reference string using FIFO and LRU policies. String:5,4,3,2,1,4,3,5,4,3,2,1,5 and time reference String:t1,t2,t3,t4,t5,t6,t7,t8,t9,t10,t11,t12,t13 number of page frames is 3.	L4	12M
Module-4				
Q. 07	a	Explain the fundamental file organization and Input Output control system in detail.	L2	10M
	b	Compare i) sequential and direct file organization. ii) linked and indexed disk space allocation.	L3	10M
OR				
Q. 08	a	With diagram explain how file access is implemented.	L2	10M
	b	Explain the allocation of disk space with necessary diagram.	L3	10M
Module-5				
Q. 09	b	Apply the deadlock detection algorithm for detecting the deadlock and explain with example.	L3	10M
	c	Define Mailbox. Explain message passing using a mailbox with necessary diagram. Also mention the advantages of using Mailboxes.	L2	10M
OR				
Q. 10	a	Define deadlock and Identify the various approaches used to prevent deadlock.	L3	10M
	c	Explain the different fields of Interprocess message control box.	L2	10M