P P SAVANI UNIVERSITY

Third Semester of B. Tech. Examination

December 2022

SEIT2031 : Operating System

07.12.2022, Wednesday **Time: 10:00 a.m. To 12:30 p.m.** **Maximum Marks: 60**

Instructions:

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION – I

Q - 1	MCQ/Short Question/Fill in the Blanks (Any Five)	**[05]**	**CO**	**BTL**
(i)	The operating system is the interface between _____and ____.		**1**	**2**
(ii)	A system call to create a child process is _____.		**2**	**1**
(iii)	Thread is a_____.		**2**	**1**
	a) Light weight process			
	b) Heavy weight process			
	c) multi-process			
	d) I/O process			
(iv)	Which of the following schedules threads?		**2**	**1**
	a) Virtual memory			
	b) Operating System			
	c) CPU			
	d) Input			
(v)	Banker's algorithm is used?		**2**	**1**
	a) To prevent deadlock			
	b) To deadlock recovery			
	c) To solve the deadlock			
	d) None of These			
(vi)	What is Network operating System		**1**	**2**
(vii)	What are the Functions of OS?		**2**	**1**
Q - 2 (a)	**Answer in Short.**	**[05]**	**1**	**2**
	1. Define fragmentation.			
	2. Define Deadlock			
	3. Explain what an operating system does and how it is used			
	4. What is bootstrap program?			
	5. What is the purpose of system calls?			
Q - 2 (b)	Explain the difference between a thread and a process	**[05]**	**2**	**1**
	OR			
Q - 2 (a)	Discuss context switching and how it is used in an operating system	**[05]**	**3**	**2**
Q - 2 (b)	Explain type of Operating System.	**[05]**	**1**	**2**
Q - 3 (a)	Consider the following scenario and find Average Waiting Time and Average Turnaround Time using ROUND ROBIN algorithm. Process Id P1 P2 P3 P4 P5 Arrival time 0 1 2 3 4 Burst time 5 3 1 2 3 Time quantum = 2 unit	**[05]**	**2**	**3**
Q - 3 (b)	Draw and explain five state Process State Transition Diagram	**[05]**	**2**	**3**

	OR			
Q - 3 (a)	Explain process control block with diagram.	**[05]**	**1**	**3**
Q - 3 (b)	Consider the following scenario and find Throughput, Average Waiting Time and Average Turnaround Time using shortest job First algorithm Process Id P1 P2 P3 P4 P5 P6 Arrival time 1 7 2 1 2 3 Burst time 0 2 3 4 5 6	**[05]**	**2**	**1**
Q - 4	Attempt anyone.	**[05]**		
(i)	Differentiate between User level threads and kernel level thread		**1**	**2**
(ii)	Differentiate between Program and Process.		**1**	**2**
	SECTION – II			
Q - 1	MCQ/Short Question/Fill in the Blanks (Any Five)	**[05]**		
(i)	What is virtual memory?		**2**	**1**
(ii)	Give example of internal fragmentation.		**2**	**2**
(iii)	Enlist different techniques of contiguous memory allocation.		**2**	**2**
(iv)	On a movable head system, the time it takes to position the head at the track is known as_____.		**2**	**1**
(v)	When dose page fault occur?		**1**	**2**
(vi)	Enlist page replacement Algorithms.		**2**	**1**
(vii)	FIFO page replacement policy does not follow a stack page replacement policy and therefore suffers from _____.		**1**	**2**
Q - 2 (a)	Given six memory partitions of 300 KB, 600 KB, 350 KB, 200 KB, 750 KB, and 125 KB (in order), how would the first-fit, best-fit, and worst-fit algorithms place processes of size 115 KB, 500 KB, 358 KB, 200 KB, and 375 KB (in order)? Rank the algorithms in terms of how efficiently they use memory.	**[05]**	**2**	**5**
Q - 2 (b)	Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130 Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests, for each of the following disk scheduling (1) SSTF (2) SCAN	**[05]**	**2**	**5**
	OR			
Q - 2 (a)	Explain the following memory allocation algorithms with suitable example: (1) Best-fit (2) Worst-fit	**[05]**	**2**	**3**
Q - 2 (b)	Explain banker's algorithm with example	**[05]**	**3**	**5**

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P1	0	1	0	7	5	3	3	3	2
P2	2	0	0	3	2	2			
P3	3	0	2	9	0	2			
P4	2	1	1	2	2	2			
P5	0	0	2	4	3	3			

Q - 3 (a)	Discuss the concept of Demand paging with the neat diagram.	**[05]**	**3**	**2**
Q - 3 (b)	Consider the following page reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. How many page faults would occur for the following LRU replacement algorithms, assuming four frames?	**[05]**	**3**	**4**
	OR			
Q - 3 (a)	Enlist File Access Methods in Operating System. Discuss any one.	**[05]**	**1**	**2**
Q - 3 (b)	Compare Contiguous file allocation method with linked file allocation method and Indexed file allocation method.	**[05]**	**3**	**2**
Q - 4	Attempt any one/two.	**[05]**		
(i)	Discuss the concept of paging with suitable diagram.		**3**	**4**

****

CO : Course Outcome Number BTL : Blooms Taxonomy Level

Level of Bloom's Revised Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create