P P SAVANI UNIVERSITY

Fourth Semester of B. SC.IT. Examination

December 2022

SSIT2040: Operating System

17.11.2022, Thursday   Time: 01:00 a.m. To 03:30 p.m.   Maximum Marks: 60

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

			CO	BTL
Q - 1	**Answer the following**	**[05]**		
(i)	Define Operating System		1	1
(ii)	Long term scheduler is responsible for selecting the process from ready queue for execution in running state. TRUE/FALSE		1	2
(iii)	Give real life example of CPU bound process		1	2
(iv)	The time taken to stop one process and start execution of another process is called as _____.		1	2
(v)	Why thread is called as Light weight Process?		2	2
Q - 2 (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 2 4 5 6 7 Burst time 6 8 2 4 5 Time quantum = 3 unit	**[05]**	3	5
Q - 2 (b)	Draw and explain five state Process State Transition Diagram	**[05]**	2	2
	OR			
Q - 2 (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]**	3	5
Q - 2 (b)	Enlist types of Semaphore? Discuss Producer-Consumer Problem.	**[05]**	2	2
Q - 3 (a)	Find Average Waiting Time (WT) and Turn Around Time (TAT) for the following example using First Come First Serve (FCFS).	**[05]**	3	5

Process	Arrival Time	Burst Time
P1	1	4
P2	2	5
P3	3	4
P4	4	7
P5	5	9

OR

Q - 3 (a) Find Average Waiting Time (WT) and Turn Around Time (TAT) for the   **[05]**   3   5
following example using First Come First Serve (FCFS).

Process	Arrival Time	Burst Time

P1	1	10
P2	2	12
P3	3	3
P4	4	8
P5	5	9

Q - 3 (b)	Explain Disk Structure in Detail.	[05]		
Q - 4	Attempt any one.	[05]		
(i)	What is Readers-Writers Problem? Explain its solution using Semaphore.		3	2
(ii)	What is Producer-Consumer Problem? Explain its solution using Semaphore.		3	2

SECTION – II

Q - 1	MCQ/Short Question/Fill in the Blanks (Any Five)	[05]		
(i)	What are file attributes.		2	1
(ii)	What are the file access method.		1	2
(iii)	What is Semaphore.		2	1
(iv)	What is race condition.		1	2
(v)	Give example of storage Device		2	1
(vi)	What's the main purpose of an OS?		1	2
(vii)	What are the Functions of OS?		2	1
Q - 2 (a)	Explain Banker's Algorithm in Operating System 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 - 2 (b)	Explain Message Passing in Detail.	[05]	2	2

OR

Q - 2 (a)	List out various deadlock handling techniques. Briefly describe any one technique for handling deadlock.	[05]	3	1
Q - 2 (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]	3	5
Q - 3 (a)	Explain Dining philosopher problem	[05]	3	5
Q - 3 (b)	Suppose that we have free segments with sizes: 6kb, 17kb, 25kb, 14kb, and 19kb. Place a program with size 13kB in the free segment using first-fit, best-fit and worst fit?	[05]	3	5

OR

Q - 3 (a)	Enlist File Access Methods in Operating System. Discuss any one.	[05]	2	1
Q - 3 (b)	Consider a disk queue with requests for I/O to blocks on cylinders 98, 183, 41, 122, 14, 124, 65, 67. The FCFS scheduling algorithm is used. The head is initially at cylinder number 53. The cylinders are numbered from 0 to 199. Calculate the total head movement (in number of cylinders) incurred while servicing these requests	[05]	3	5

| Q - 4 | Answer the following | [05] | | |
| (ii) | Enlist Disk Scheduling Algorithms. Compare SCAN & CSCAN disk scheduling algorithms with a short example. | | 2 | 3 |

****

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