USN | | | | | | | | | |

SMVITM

SHRI MADHWA VADIRAJA INSTITUTE OF TECHNOLOGY & MANAGEMENT, BANTAKAL

Department: Computer Science and Engineering	IA- I	Academic Year: 2022-23
Class: 4th Sem	Course: Operating Systems	Course Code: 21CS44
Date: 11-07-2023	Duration: 60 minutes	Max. Marks: 20

QP Version: B

*Note: Answer **one full question from each part***

Qn. No	Question	Marks	PI*	BL*	CO*
	PART A				
1a	Explain dual mode operation in OS with neat diagram	6	1.4.1	L2	CO1
1b	Explain role of operating system in process management and memory management.	4	1.4.1	L2	CO1
	OR				
2a	What are system calls? Briefly explain any two kinds of system calls	5	1.4.1	L2	CO1
2b	With a neat diagram, explain different states of a process.	5	2.2.2	L2	CO1
	PART B				
3a	Explain any two threading issues with multithreaded model	4	1.3.1	L2	CO2
3a	Consider the following set of processes, smaller number represents highest priority. Prepare Gantt chart and calculate the average turnaround time and average waiting time making use of Preemptive priority scheduling.	6	1.3.1	L3	CO2
	OR				
4a	Explain multithreaded models with diagrams	5	1.3.1	L2	CO2
4b	Consider the following set of processes. Prepare Gantt chart and calculate the average turnaround time and average waiting time making use of Preemptive SJF scheduling.	5	4.1.2	L3	CO2

Process	Arrival time	Priority	Burst time
P1	0	3	8
P2	1	4	2
P3	3	4	4
P4	4	5	1
P5	5	2	6
P6	6	6	5
P7	10	1	1

Process	Arrival time	Burst time
P1	0	5
P2	1	3
P3	2	1
P4	3	2
P5	4	3

BL* Bloom'sTaxonomyLevel; CO* Course Outcome; PI- Performance Indicator

Principal
SHRI MADHWA VADIRAJA
INSTITUTE OF TECHNOLOGY & MANAGEMENT
Vishwothama Nagar Udupi Dist.
BANTAKAL - 574 115

QP quality

CO	Maximum Marks	Maximum marks		% questions	
		L2 level questions	L3 level questions	L2 level questions	L3 level questions
CO3	10	10	-	25	0
CO4	30	20	10	50	25

Overall QP quality = 2 X % L2 questions + 3 X % L3 questions

Overall QP quality = 2X75+3X25=225/100= **2.25**

Prepared By (Name & signature with date):
Mrs.Savitha Shenoy
Mr.Ranjan Kumar

8/9/23

Remarks by scrutiny team: Overall quality of version A is better compared to version B

Course type (Theoretical/Theoretical & numerical/Numerical)

Scrutinized by (Name & signature with date): Sadananda I. 8/9/23

Rajkumar Hod 08/09/2023

QP selected for the test: YES/NO

8/9/23
(IC)
HoD Signature with date and seal

Principal
SHRI MADHWA VADIRAJA
INSTITUTE OF TECHNOLOGY & MANAGEMENT
Vishwothama Nagar, Udupi Dist.
BANTAKAL - 574 115

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

SMVITM

SHRI MADHWA VADIRAJA INSTITUTE OF TECHNOLOGY & MANAGEMENT, BANTAKAL

Department: Computer Science and Engineering	IA- II	Academic Year: 2022-23
Class: IV sem	Course: Operating Systems	Course Code: 21CS44
Date: 08-08-2023	Duration: 60 minutes	Max. Marks: 20

QP Version: A

Note: Answer one complete question from each PART

PART A

Qn. No	Question	Marks	PI*	BL*	CO*
1a.	What is semaphore? Write C language implementation of semaphore that does not require busy waiting.	5	2.2.4	L3	CO2
1b.	Define monitor. Explain the syntax and schematic view of monitor with a neat diagram.	5	2.2.3	L2	CO2
	OR				
2a.	Write the monitor solution to dining philosopher's problem	5	2.2.3	L3	CO2
2b.	Define Race Condition. Discuss the requirements that the solution to the critical section problem must satisfy.	5	2.2.4	L2	CO2
	PART B				
3a.	Consider the System with the following Resource allocation state. Allocation: P0 A B C = 1 1 2; P1 = 2 1 2; P2 = 4 0 1; P3 = 0 2 0; P4 = 1 1 2 Max: P0 A B C = 4 3 3; P1 = 3 2 2; P2 = 9 0 2; P3 = 7 5 3; P4 = 11 2 3 Available: A B C = 2 1 0 a. Determine the total amount of resources of each type. b. Represent the "Need Matrix"? c. Determine if the state is "Safe" using Safety Algorithm".	5	1.3.1	L3	CO3
3b.	Explain the significance of wait-for-graph in deadlock detection with an example.	5	1.3.1	L2	CO3
	OR				
4a.	Draw the resource allocation graph and determine the state of deadlock a. Resource instances: One instance of resource type R1 Two instances of resource type R2 One instance of resource type R3 Three instances of resource type R4 b. Process states: o Process P1 is holding an instance of resource type R2 and is waiting for an instance of resource type R1. o Process P2 is holding an instance of R1, an instance of R4 and an instance of R2 and is waiting for an instance of R3 . o Process P3, is holding an instance of R3 and waiting for an instance of R2 and also waiting for an instance of R4.	5	1.3.1	L3	CO3
4b.	Define Deadlocks. Explain the necessary conditions for the occurrence of deadlock	5	1.3.1	L2	CO3

BL* Bloom's Taxonomy Level; CO* Course Outcome; PI- Performance Indicator

Principal
SHRI MADHWA VADIRAJA
INSTITUTE OF TECHNOLOGY & MANAGEMENT
Vishwothama Nagar, Udupi Dist.

QP quality

CO	Maximum Marks	Maximum marks			% Questions		
		L2 level questions	L3 level questions	L4 level questions	L2 level questions	L3 level questions	L4 level questions
CO1	20	20	00	00	50	00	00
CO2	20	9	11	00	22.5	27.5	00

Overall QP quality = 2 X % L2 questions + 3 X % L3 questions + 4 X % L4 questions

Overall QP quality= 2X72.5+3*27.7+4X0=228/100= **2.28**

Prepared By (Name & signature with date):
Mr. Ranjan Kumar H S
Mrs. Savitha shenoy 7/7/2023

Remarks by scrutiny team: This is the selected version.
Course type (Theoretical/Theoretical&numerical/Numerical)

Soumya BH
Sy 7/7/23
Scrutinized by (Name & signature with date):

QP selected for the test: YES/NO

Sy 7/7/23
HoD Signature with date and seal

Head
Dept. of Comp.Science & Engg
SMVITM, BANTAKAL-574115

Principal
SHRI MADHWA VADIRAJA
INSTITUTE OF TECHNOLOGY & MANAGEMENT
Vishwothama Nagar, Udupi Dist.
BANTAKAL - 574 115

USN										

SHVITM

SHRI MADHWA VADIRAJA INSTITUTE OF TECHNOLOGY & MANAGEMENT, BANTAKAL

Department: Computer Science and Engineering	IA- III	Academic Year: 2022-23
Class: IV sem	Course: Operating Systems	Course Code: 21CS44
Date: 12-09-2023	Duration: 60 minutes	Max. Marks: 20

QP Version: A

Note: Answer one complete question from each PART

PART A

Qn. No	Question	Marks	PI*	BL*	CO*
1a.	What is segmentation? Explain the segmentation hardware with a neat diagram	5	2.2.4	L2	CO3
1b.	Given reference to the following pages by a program, 0,9,0,1,8,1,8,7,8,7,1,2,8,2,7,8,2,3,8,3 How many page faults will occur if the program has three-page frames available to it and uses i) LRU Replacement ii) FIFO Replacement	5	2.2.4	L3	CO4
	OR				
2a.	With a neat diagram explain the working of the inverted page table.	5	4.1.2	L2	CO3
2b.	On a system using demand-paged memory, it takes 150ns to satisfy a memory request if the page is in memory. The page fault rate is 10%. To achieve an effective access time of 500µs What would the average time used to satisfy a request for a page not in memory. (Specify the time in micro seconds)	5	2.2.4	L3	CO4
	PART B				
3a.	Explain the following directory structure i) Single-Level Directory.	5	1.4.1	L2	CO4
3b.	Explain the procedure for handling the page fault.	5	2.2.4	L2	CO4
	OR				
4a.	Explain the implementation of the directory using a linear list.	5	1.4.1	L2	CO4
4b.	Discuss the different operations possible on a file.	5	1.4.1	L2	CO4

BL* Bloom's Taxonomy Level; CO* Course Outcome; PI- Performance Indicator

Principal
SHRI MADHWA VADIRAJA
INSTITUTE OF TECHNOLOGY & MANAGEMENT
Vishwothama Nagar Udupi Dist.
BANTAKAL - 574 115

QP quality

CO	Maximum Marks	Maximum marks		% questions	
		L2 level questions	L3 level questions	L2 level questions	L3 level questions
CO2	20	10	10	25	25
CO3	20	10	10	25	25

Overall QP quality = 2 X % L2 questions + 3 X % L3 questions

Overall QP quality = 2X50+3X50=250/100= **2.5**

Prepared By (Name & signature with date):
Mrs.Savitha Shenoy 04/08/23
Mrs. Soumya S

Remarks by scrutiny team:
Course type (Theoretical/Theoretical & numerical/Numerical)

Question paper follows standard format

Deepak Rao M
04/08/23

Scrutinized by (Name & signature with date): Sahana

QP selected for the test: YES/~~NO~~

4/8/23
HoD Signature with date and seal

Head
Dept. of Comp.Science & Engg.
SMVITM, BANTAKAL-574115

Principal
SHRI MADHWA VADIRAJA
INSTITUTE OF TECHNOLOGY & MANAGEMENT
Vishwothama Nagar, Udupi Dist.
BANTAKAL - 574 115