VIT
Vellore Institute of Technology

		SLOT :	B2
School of Information Technology and Engineering			
Winter Semester 2022-2023		Continuous Assessment Test – II	
Programme Name & Branch		MCA	
Course	ITA5006	Course	Distributed Operating Systems
Class	VL2022230500270 , VL2022230500524, VL2022230500243		
Faculty	Dr.M.RAJKUMAR, Dr.T.SENTHIL KUMAR, Dr.D.KARTHIKEYAN		

Exam Duration: 90 Min. **Maximum Marks: 50**

General instruction(s): Answer ALL Questions.

Q.No. Question **Max Marks**

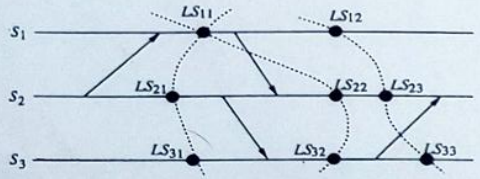
1. 

10

1. For the event diagram above, label all events with vector clocks. Assume that the vector elements are all set to zero at the beginning. (6 marks)

2. Apply the vector timestamp rules to determine whether the following event pairs are concurrent events or not? Explain why. (4 marks)

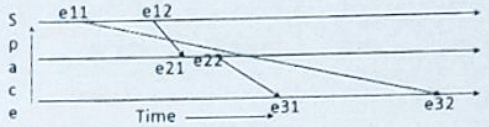
a) Is g || q? b) Is e || u?

2. 

10

Analyze the above space -time diagram and identify whether the global state events are consistent or in- consistent or strongly consistent paths. Examine with Lamport's Chandy global state recording algorithm with marker rule.

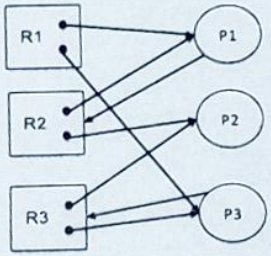
3. Consider the below space -time diagram 10



(i) Trace SES protocol to ensure the ordering of messages in above scenario. (5)

(ii) Discuss BSS protocol for causal ordering of messages for the above diagram. In what way this algorithm is different from SES protocol? (5)

4. Consider the following resource allocation graph: 10



a) Does the above allocation graph contain a deadlock? Justify your answer. (3 marks)

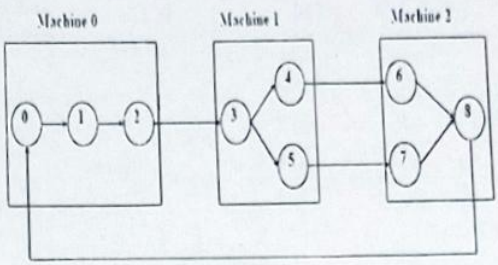
b) Assume now that P2 also demands resource R1. Does this allocation graph contain a deadlock? Explain your answer. (3 marks)

c) Assume the allocation graph at point b), and, in addition, assume that R2 has now three instances. Does this allocation graph contain a deadlock? Justify your answer. (4 marks).

5. Consider the below global state transition diagram, 10

a) construct the WFG and detect the deadlock cycle if any. (3 marks)

b) Using Chandy-Misra-Hass's algorithm evaluate the probe values at each process and justify how it detects the deadlocks in distributed systems. (7 marks)


Machine 0
Machine 1
Machine 2
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