Enrollment No._____

NAVRACHANA UNIVERSITY
a UGC recognized University

School: School of Engineering and Technology
Program/s: BTech-IT
Year: 4th **Semester:** 7th
Examination: End Semester Examination
Examination year: December - 2021

Course Code: IT406 **Course Name:** **Distributed Computing**
Date: 06/12/2021 **Total Marks:** 40
Time: 11:30 am to 1:30 pm **Total Pages:** 3

Instructions:

- *Write each answer on a new page.*
- *Use of a calculator is not permitted.*
- ** COs=Course Outcome mapping. # BTL=Bloom's Taxonomy Level mapping*

Q. No.	Details	Marks	COs*	BTL#
Q.1	**Multiple Choice (Answer ALL).**	**10X1=10**		
	I. Which of the following is/are example(s) of election algorithm? A. Lamport's algorithm B. Bully algorithm C. Both A and B D. None		CO3	BT1
	II. In mutual exclusion, processes request to enter in _____. A. distributed network region B. critical region C. main memory region D. mutual region		CO3	BT1
	III. A remote procedure call is initiated by _____. A. the server B. the client C. both the client and the server D. any third party		CO3	BT1
	IV. The ring election algorithm works by: A. Having all nodes in a ring of processors send a message to a coordinator who will elect the leader. B. Sending a token around a set of nodes and whoever has the token becomes the coordinator. C. Sending a message around all available nodes and choosing the first one on the resultant list. D. Building a list of all live nodes and choosing the largest numbered node in the list.		CO3	BT1, BT2
	V. Mitchell and Merritt's algorithm for the single resource model belongs to the class of _____. A. Path-pushing algorithms		CO2	BT1

B. Edge-chasing algorithms
C. Global state detection-based algorithms
D. None

VI. Distributed Mutual Exclusion Algorithm does not use
A. Coordinator process
B. Token
C. Logical clock for event ordering
D. Request and Reply messages

CO2 | BT1, BT2

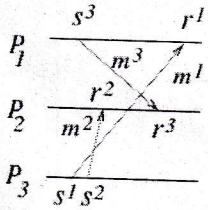
VII. Which is true in RMI?
A. A process invokes memory on a remote object.
B. A process invokes a method on a remote object.
C. Both A and B
D. None

CO3 | BT1, BT2

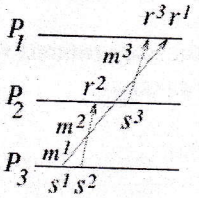
VIII. _____ is the ability of system to provide a service, even in the presence of errors.
A. Replication
B. Fault tolerance
C. Concurrency
D. Consistency

CO4 | BT1, BT2

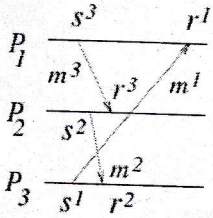
IX. A causal order is an asynchronous execution in which, for all (s,r) and $(s',r') \in T$, $(r \sim r' and\ s \prec s') \Rightarrow r \prec r'$. So, the figure _____ violates causal order.



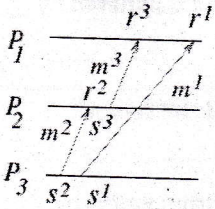
(A)



(B)



(C)



(D)

CO2 | BT1, BT2, BT3

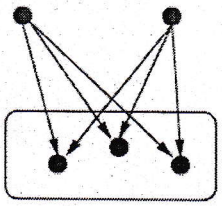
X. The correctness criteria for deadlock detection algorithm is _____.
A. safety
B. progress
C. safety and progress
D. none

CO2 | BT1

Q.2 **Fill in the blank (Answer ALL).** **5X1=5**

I. In the following figure, the source-destination relationship for multicasting is _____.

CO2 | BT1, BT2

	 II. Suppose a process on machine A calls a procedure on machine B, then calling process on A is suspended, and execution of the called procedure takes place on B. This method is known as _____.		CO3	BT2
	III. The two classes in Java RMI are _____ class and _____ class.		CO3	BT1
	IV. In cryptosystems, _____ is a large random or pseudo-random number that is drawn from a large space so that it is difficult to guess by an intruder.		CO4	BT1
	V. The Needham-Schroeder protocol is an example of _____ cryptosystem.		CO4	BT1
Q.3	**Answer any FIVE.**	**5X5=25**		
	I. Describe Mitchell and Merritt's algorithm for the single-resource model with suitable state transitions diagram. State the message complexity of Mitchell and Merritt's algorithm.		CO2	BT1, BT2
	II. Show various steps of SSL handshake protocol and data exchange with the help of a diagram.		CO4	BT1, BT2
	III. With the help of a neat diagram, explain implementation of RPC.		CO3	BT1, BT2
	IV. Briefly describe three steps of authentication in Kerberos authentication protocol with the help of a diagram.		CO4	BT1, BT2
	V. Discuss three-phase distributed algorithm for total order. Mention the message complexity of the algorithm.		CO2	BT1, BT2
	VI. State the Knapp's classification of distributed deadlock detection algorithms. Explain any one of such classes.		CO2	BT1, BT2
	VII. Describe the operation of bully algorithm with an example and suitable figure.		CO3	BT1, BT2, BT3
	VIII. What is Java RMI. Briefly explain three participating processes in Java RMI.		CO3	BT1, BT2

**********End of Question Paper**********