



Shirpur Education Society's  
**R. C. PATEL INSTITUTE OF TECHNOLOGY, SHIRPUR**

*An Autonomous Institute*

[ Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere ]



**आर. सी. पटेल इन्स्टिट्यूट ऑफ टेक्नोलॉजी, शिरपुर**  
(स्वायत्र महाविद्यालय)

**Academic Year (2022-23)**

**Year: 3 Semester: V**

**Program: B. Tech. (CSE –Data Science)**

**Max. Marks: 75**

**Subject: Distributed Computing (PECSS5051T)**

**Time: 10:30 am to 1:30 pm**

**Date: 12/01/2003**

**Duration: 3 Hours**

**END SEM EXAMINATION –ODD SEM-V (Regular)**

**Instructions:** Candidates should read carefully the instructions printed on the question paper and on the cover page of the Answer Book, which is provided for their use.

- (1) This question paper contains 1 page.
- (2) All Questions are Compulsory.
- (3) All questions carry equal marks.
- (4) Answer to each new question is to be started on a fresh page.
- (5) Figures in the brackets on the right indicate full marks.
- (6) Assume suitable data wherever required, but justify it.
- (7) Draw the neat labelled diagrams, wherever necessary.

<b>Question No.</b>		<b>Max. Marks</b>
Q1 (a)	Define Distributed Systems. Explain in detail the issues in designing distributed systems.  <b>OR</b> Define Distributed Systems. Explain with neat diagrams different distributed system models.	[10]
Q1 (b)	Explain the desirable features of a process migration mechanism.	[05]
Q2 (a)	Define Interprocess Communication. Explain different types of communications.  <b>OR</b> What is Remote Procedure Call? Discuss the working of RPC in detail.	[10]
Q2 (b)	Discuss Group Communication in brief.	[05]
Q3 (a)	A distributed system has 3 nodes n1, n2, and n3 each having its own clock. The clock at nodes n1, n2, and n3 tick 495, 500, and 505 times per millisecond. The system uses an external clock synchronization mechanism in which all nodes receive real-time every 20 seconds from the external file source and readjust their clocks. What is the maximum clock skew that will occur in this system?	[05]
Q3 (b)	Consider a system with 10 units of resource for which four processes P1, P2, P3, and P4 are competing. Suppose the maximum units of each resource required by P1, P2, P3, and P4 are 3, 4, 5, and 8 respectively and they are currently holding two units each of the resource. Find out if the current state of the system is safe or unsafe. If it is safe, list the safe sequence.	[10]
Q4 (a)	Illustrate the Data Centric Consistency Models with suitable examples.  <b>OR</b> Explain Berkeley Algorithm in detail.	[10]
Q4 (b)	Discuss the desirable features of a global scheduling algorithm.	[05]
Q5 (a)	Explain the architecture of Distributed Shared Memory (DSM).  <b>OR</b> Describe the issues in the design and implementation of DSM systems.	[05]
Q5 (b)	Explain File Caching Schemes in detail.	[10]

*Verified*  
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