In Pursuit of Excellence	**Course and Faculty Details**	SESSION-2019-2020 SEM- 7th

Faculty Details

Name of the Faculty: Prachi Gupta

Designation: Assistant Professor

Department: CS&E

Course Details

Name of the Programme: B.Tech.

Batch: 2016-2020

Branch: Computer Science

Section: B,C

Name of Subject: Distributed System

Subject Code: RCS-701

Category of Course: Core Subject

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Moradabad Institute of Technology
Moradabad-244001

In Pursuit of Excellence	**Index**	SESSION-2019-2020 SEM- 7th

Dr. Somesh Kumar
Prof. & Head, CSE
Moradabad Institute of Technology
Moradabad-244001

Dr. Somesh Kumar
Prof. & Head, CSE
Moradabad Institute of Technology
Moradabad-244001

In Pursuit of Excellence	Vision & Mission of Institute	SESSION-2019-20
		SEM- 7th

Vision of Institute

To develop industry ready professionals with values and ethics for global needs.

Mission of Institute

- To impart education through outcome based pedagogic principles.
- To provide conducive environment for personality development, training and entrepreneurial skills.
- To induct high professional ethics and accountability towards society in students.

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Vision of Department

To develop globally recognized computer science and engineering graduates with ethical values for need of software industries.

Mission of Department

1. To impart knowledge through well-defined instructional objectives in the field of computer science and engineering.
2. To provide learning ambiance for skills, innovation, leadership and overall personality development.
3. To inculcate professional ethics, teamwork and responsiveness towards society.

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Program Education Objectives

PEO 1: The graduates will have entrepreneurial and employable skills in software industries, by adapting themselves in the corporate world by utilizing the defined instructional objectives learnt in the program.

PEO 2: The graduates will engage in skill enhancement, that would help to work in their own area of interest, individually or in a team.

PEO 3: The graduates will demonstrate ownership and responsiveness towards the profession and the society.

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In Pursuit of Excellence	Program Outcomes	SESSION-2019-2020 SEM- 7th

Program Outcomes

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problems.

2. Problem analysis: Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems: Use research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling to complex engineering activities, with an understanding of the limitations.

6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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10. Communication: Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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Program Specific Outcomes (PSO's)

After completing their graduation, students of Computer Science and Engineering will be able to -

PSO1: Comprehend the core subjects of CSE and apply them to resolve domain specific tribulations.

PSO2: Extrapolate the fundamental concepts in engineering and to apply latest technology with programming language skills to develop, test, implement and maintain software products.

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In Pursuit of Excellence	Academic Calendar	SESSION-2019-2020 SEM-VII

Moradabad Institute of Technology

Rampanga Vihar Phase – II, Moradabad

ACADEMIC CALENDAR

ODD Semester Session: 2019 – 2020

S. No.	Particulars	Date	Responsibility
1.	Time Table (a) Display on Notice Boards (b) Distribution to concerned Teachers	29 July 2019 29 July 2019	O.C. Time – Table
2.	Distribution of class lists to teachers	29 July 2019	O.C. Class / DR
3.	Registrations (a) 3rd / 5th /7th Semester (b) List of unregistered students to various department (c) Notifying unregistered students for getting registered at the earliest (through class O.Cs. / Faculty)	1,2,3 Aug 2019 20 Aug 2019 22 Aug 2019	Concerned Teachers OS Academic Concerned HODs
4.	Commencement of Classes 3rd / 5th / 7th Semester	2,3,4 Aug 2019	Concerned Teachers
5.	Blow up submission to HODs	30 July 2019	Concerned Teachers
6.	Announcement of Test series dates	16Aug 2019	Dean Academics
7.	(a) Collection of Examination forms from University and announcement of date for availability of forms (b) Last date for submission of forms in office (c) Submission of forms to University	30 Aug 2019**	OS Academic to take timely action as per University directions
8.	Procurement of stationary & materials for Test Series for full semester (a) Requirement (b) Actual Procurement	31 Aug 2019 5 Sept 2019	Convener Test series Committee O.S. Academics
9.	(a)Short attendance compilation and information to parents and undertaking format handed over to students (b)Collection of Short attendance undertaking	09 Sept 2019 11 Sept 2019	O.C. Class
10.	1st Test Series Thu, Fri, Sat	12, 13,14, Sept 2019	
	(a) Announcement of Test Series schedule, Invigilation Programme, Seating arrangement etc.	11 Sept 2019	Class Test Committee
	(b) After completion of Test Series- Evaluation of test copies & showing of copies to students (c) Submission of test copies in Nodal Centre (d) Report of poor performance of students to class OCs	21 Sept 2019 25 Sept 2019 26 Sept 2019	Concerned Teachers Concerned Teachers Concerned Teachers
	(e) Short attendance compilation, display on notice board and information to parents	19 Oct 2019	O.C. Class
11.	2nd Test Series Wed, Thus, Fri	23,24, 25 Oct 2019	
	(a) Announcement of Test Series schedule, Invigilation Programme, seating arrangement etc	22 Oct 2019	Class Test Committee

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	(b) After completion of Test Series - Evaluation of test copies & showing of copies to students (c) Submission of test copies in Nodal Centre (d) Report of poor performance of students to class OCs	02 Nov 2019 04 Nov 2019 05 Nov 2019	Concerned Teachers Concerned Teachers Concerned Teachers
12.	Filling of student feedback forms for current semester	27 Nov 2019	Concerned HODs
13.	Requirement of additional Faculty (to be conveyed to Director) (for even semester)	30 Nov 2019	Concerned HODs
14.	(a) Floating the electives for even semester (b) Last date for students choice	26 Nov 2019 30 Nov 2019	Concerned HODs
15.	Announcement of dues list and its last date for clearing dues (Current semester)	22 Oct 2019	Accounts/ OS Academic
16.	Date up to which final attendance is to be counted	29 Nov 2019	Concerned Teachers
17.	Submission of consolidated list of shortage of attendance to Director and information to Parents	30 Nov 2019	Class O.Cs
18.	3rd Test Series Thu, Fri, Sat	28,29,30 Nov 2019	
	(a) Announcement of Test Series schedule, Invigilation Programme, Seating arrangement etc.	27 Nov 2019	Class Test Committee
	(b) After completion of Test Series- Evaluation of test copies & showing of copies to students (c) Submission of test copies in Nodal Centre (d) Report of poor performance of students to class OCs	03 Dec 2019 04 Dec 2019 04 Dec 2019	Concerned Teacher Concerned Teachers Concerned Teachers
19.	Submission of sessional marks: (a) Meeting of Dean Academics , all HODs and Director regarding attendance and performance of students.	04 Dec 2019	Dean Academics
	(b) Checking of Teachers' Records by HODs	05 Dec 2019	Concerned HODs
	(c) Finalization of sessional marks	05 Dec 2019	Concerned Teachers
	(d) Submission of Award list after final checking and uploading to OS Academics for further necessary action	As per date announced by AKTU	HODs Concerned Teachers
20.	Theory Examinations: (a) Collection of Admit Cards / Roll Nos. from University (b) Preparation of Roll lists (c) Collection of stationery such as copies, practical copies drawing sheets, graph paper etc. from University. (c) Procurement of stationery and other materials locally as necessary.	As per AKTU schedule	OS Academics to take appropriate actions as per University directions.
21.	Practical Examinations:		
	(a) Appointment of Internal Examiners	As per AKTU schedule	Concerned HODs
	(b) Obtaining list of panel of External Examiners from AKTU & preparation of schedule of practical examinations	5 days before the practical exam schedule	Concerned HODs
	(d) Dispatch of letters/contacting the external examiners	As per AKTU schedule	OS Academics
		Within 7 days of list obtained from AKTU	HODs and concerned teachers

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22.	Preparation for Even Semester (a) Load Distribution by Department (b) Submission to O.C. Time-Table (c) Display of Time Table on Notice Board	10 Dec 2019 12 Dec 2019 18 Jan 2020	Concerned Coordinators O.C. Time Table
23.	Registration for Even semester [2019 – 20]	To be announced**	OS Academic
24.	Announcement of Academic calendar for Even semester [2019 – 20]	5 Days before the start of Even sem.	Dean Academics

**May be revised as per AKTU Schedule.

24.7.2019

Dean Academics

Director

Copy to:

1. Chairman	2. Secretary	3. P.A. to Director for Director's table
4. All HODs	5. DOSW	6. Controller Examination
7. Associate Dean Academics	8. Registrar	9. All Faculty Members through HODs
10. O.S. Academics	11. A.S. Examination	12. Accounts Section
13. T & P Cell	14. Librarian	15. Coaching/ Test Series/ O.C. Time Table

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MORADABAD INSTITUTE OF TECHNOLOGY, MORADABAD

Ram Ganga Vihar Phase-II Moradabad (U.P.)
Approved by AICTE and Affiliated to Dr. A. P. J. Abdul Kalam Technical University, Lucknow
Website: http://mitmoradabad.edu.in

Department Academic Calendar, Odd Semester, Session (2019 – 2020)

VISION

To develop globally recognized computer science and engineering graduates with ethical values for need of software industries.

MISSION

M1: To impart knowledge through well defined instructional objectives in the field of computer science and engineering.

M2: To provide a learning ambience for skills, innovation, leadership and overall personality development.

M3: To inculcate professional ethics, teamwork and responsiveness towards society.

JULY-2019

Su	M	T	W	Th	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

AUGUST-2019

Su	M	T	W	Th	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

SEPTEMBER-2019

Su	M	T	W	Th	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

OCTOBER-2019

Su	M	T	W	Th	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

NOVEMBER-2019

Su	M	T	W	Th	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

DECEMBER-2019

Su	M	T	W	Th	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

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A	Time Table Display on Notice Boards
B	Blow Up Submission to HODs
C	3rd /5th /7th semester registration
D	Commencement of Classes of 3rd /5th /7th semester
E	Eid Ul Zuha
F	Independence day and Rakshabandhan
G	Event 'Kanha ki Matki' by CSSS
H	Krishna Janmashtami
I	Short Attendance compilation and information to parents
J	Moharram
K	1st Test Series
L	Submission of Test copies in Nodal Center
M	Event 'ArtShala' by CSSS
N	Gandhi Jayanti
O	Expert Lecture on DevSecOps by Mr.Kavish Baghel, Thoughts2Binary Gurugram
P	Maha Navmi
Q	Dusshera
R	Maharishi Valmiki Jayanti
S	Event 'KuruShetra' by CSSS
T	Short Attendance compilation and information to parents
U	2nd Test Series
V	Mid Semester Break
W	Submission of Test copies in Nodal Center
X	Eid-e-eMilad
Y	Guru Nanak Birthday
Z	Event 'Coder 6.0' by CSSS
AA	Floating the electives for even sem (2019-20)
AB	Filling of Student Feedback form for current Semester
AC	3rd Test Series
AD	Submission of consolidated list of shortage of attendance to director and information to parents
AE	Submission of Test copies in Nodal Center
AF	Submission of Sessional marks
AG	Christmas

Month	Dates of Teaching Days (2nd, 3rd & 4th Year)	No. of Teaching Days	No. of Lecture Hours
Jul-19	-	NA	91* 6=546
Aug-19	3,5,6,7,8,9,10,13,14,16,17,19,20,21,22,24,26,27,28,29,30,31	22	
Sep-19	2,3,4,5,6,7,9,11,16,17,18,19,120,21,23,24,25,26,27,28,30	21	
Oct-19	1,3,4,5,9,10,11,12,14,15,16,17,18,19,21,22,31	17	
Nov-19	1,2,4,5,6,7,8,9,11,13,14,15,16,18,19,20,21,22,23,25,26,27	22	
		82	
	Sessional Examinations	09	
	Total	**91**	**546**

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In Pursuit of Excellence	**Course Evaluation Scheme**	SESSION-2019-2020
		SEM- VII

B.Tech. (Computer Science and Engineering)
VII SEMESTER

Sl. No.	Subject Code	Subject Name	L-T-P	Th/Lab Marks	Sessional		Total	Credit
				ESE	CT	TA		
1	Open Elective-1	Open Elective Course -1	3--0--0	70	20	10	100	3
2	CS Elective-3	Deptt Elective Course-3	3--0--0	70	20	10	100	3
3	CS Elective-4	Deptt Elective Course-4	3--1--0	70	20	10	100	4
4	RCS701	Distributed System	3--1--0	70	20	10	100	4
5	RCS702	Artificial Intelligence	3--0--0	70	20	10	100	3
6	RCS751	Distributed System Lab	0--0--2	50		50	100	1
7	RCS752	Artificial Intelligence Lab	0--0--2	50		50	100	1
8	RCS753	Industrial Training	0--0--3			100	100	2
9	RCS754	Project	0--0--6			200	200	3
	TOTAL			450	100	450	1000	24

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NCS-701 DISTRIBUTED SYSTEMS

Unit I

Characterization of Distributed Systems:
Introduction, Examples of distributed Systems, Resource sharing and the Web Challenges. Architectural models, Fundamental Models.

Theoretical Foundation for Distributed System:
Limitation of Distributed system, absence of global clock, shared memory, Logical clocks, Lamport's & vectors logical clocks. Concepts in Message Passing Systems: causal order, total order, total causal order, Techniques for Message Ordering, Causal ordering of messages, global state, termination detection.

Unit II

Distributed Mutual Exclusion:
Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, Token based and non token based algorithms, performance metric for distributed mutual exclusion algorithms.

Distributed Deadlock Detection:
System model, resource Vs communication deadlocks, Deadlock prevention, avoidance, detection & resolution, centralized dead lock detection, distributed deadlock detection, path pushing algorithms, edge chasing algorithms.

Unit III

Agreement Protocols: Introduction, System models, classification of Agreement Problem, Byzantine agreement problem, Consensus problem, Interactive consistency Problem, Solution to Byzantine Agreement problem, Application of Agreement problem, Atomic Commit in Distributed Database system.

Distributed Resource Management: Issues in distributed File Systems, Mechanism for building distributed file systems, Design issues in Distributed Shared Memory, Algorithm for Implementation of Distributed Shared Memory.

Unit IV

Failure Recovery in Distributed Systems: Concepts in Backward and Forward recovery, Recovery in Concurrent systems, Obtaining consistent Checkpoints, Recovery in Distributed Database Systems.

Fault Tolerance: Issues in Fault Tolerance, Commit Protocols, Voting protocols, Dynamic voting protocols.

Unit V

Transactions and Concurrency Control:
Transactions, Nested transactions, Locks, Optimistic Concurrency control, Timestamp ordering, Comparison of methods for concurrency control.

Distributed Transactions: Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery. Replication: System model and group communication, Fault - tolerant services, highly available services, Transactions with replicated data.

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References:

1. Singhal&Shivaratri, "Advanced Concept in Operating Systems", McGraw Hill
2. Ramakrishna,Gehrke," Database Management Systems", McGraw Hill
3. Vijay K.Garg Elements of Distributed Compuitng , Wiley
4. Coulouris, Dollimore, Kindberg, "Distributed System: Concepts and Design", Pearson Education
5. Tenanuanbaum, Steen," Distributed Systems", PHI

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In Pursuit of Excellence	Syllabus Adopted by the Program	SESSION-2019-2020
		SEM-VII

Syllabus

Pre-requisites:

The student should have basic knowledge of Operating System and basics of DBMS.

RCS-701 Distributed Systems

Unit I

Introduction

Review: ***Brief review of Operating System concepts***

Characterization of Distributed Systems: Introduction, Examples of distributed Systems, Resource sharing and the Web Challenges.

Bridging: ***Goals & Basic Design Issues of DS***

Architectural models, Fundamental Models.

Theoretical Foundation for Distributed System: Limitation of Distributed system, absence of global clock, shared memory, Logical clocks, Lamport's & vectors logical clocks. Concepts in Message Passing Systems: causal order, total order, total causal order, Techniques for Message Ordering, Causal ordering of messages, global state, termination detection.

Beyond: ***Design Requirements for Distributed Architecture***

Unit II

Review: Basic concept of Mutual Exclusion and its applications

Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, Token based and non token based algorithms, performance metric for distributed mutual exclusion algorithms.

Distributed Deadlock Detection: System model, resource Vs communication deadlocks, Deadlock prevention, avoidance, detection & resolution, centralized dead lock detection, distributed deadlock detection, path pushing algorithms, edge chasing algorithms.

Beyond: ***Deadlock vs Livelock vs Starvation***

Unit III

Agreement Protocols: Introduction, System models, classification of Agreement Problem, Byzantine agreement problem, Consensus problem, Interactive consistency Problem, Solution to Byzantine Agreement problem, Application of Agreement problem, Atomic Commit in Distributed Database system.

Distributed Resource Management: Issues in distributed File Systems, Mechanism for building distributed file systems, Design issues in Distributed Shared Memory

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Bridging: Shared memory vs Message passing
Algorithm for Implementation of Distributed Shared Memory.
Beyond: ***Case Study of Sun NFS***

Unit IV

Failure Recovery in Distributed Systems: Concepts in Backward and Forward recovery, Recovery in Concurrent systems, Obtaining consistent Checkpoints, Recovery in Distributed Database Systems.
Fault Tolerance: Issues in Fault Tolerance, Commit Protocols, Voting protocols, Dynamic voting protocols.

Unit V

Transactions and Concurrency Control:
Transactions, Nested transactions, Locks, Optimistic Concurrency control, Timestamp ordering, Comparison of methods for concurrency control.
Distributed Transactions: Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery. Replication: System model and group communication, Fault - tolerant services, highly available services, Transactions with replicated data.

References:

1. Tenanuanbaum, Steen," Distributed Systems", PHI
2. Ramakrishna,Gehrke," Database Management Systems", McGraw Hill
3. Vijay K.Garg Elements of Distributed Compuitng , Wiley

Text Books:

4. Ken . Singhal&Shivaratri, "Advanced Concept in Operating Systems", McGraw Hill
5. Coulouris, Dollimore, Kindberg, "Distributed System: Concepts and Design", Pearson Education

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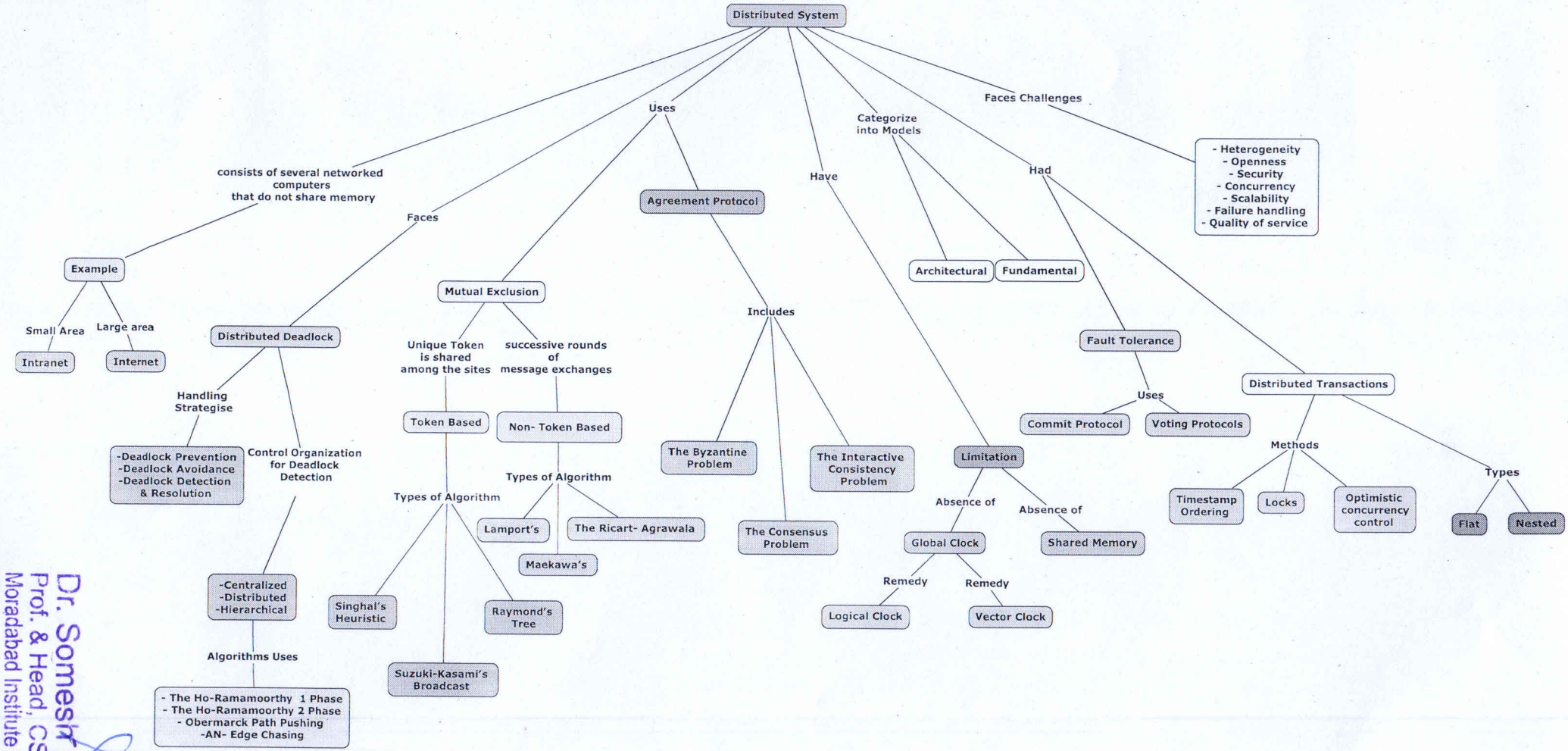
Concept Map



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In Pursuit of Excellence	Course Outcomes	SESSION-2019-2020
		SEM-VII

COURSE OUTCOMES

Once the student has successfully completed this course, he/she will be able to:

CO1. Identify distributed system characteristics and familiar with concepts of logical and vector clocks. [Apply]

CO2. Analyze the advantages and challenges in designing distributed algorithms for different primitives like mutual exclusion and deadlock detection. [Analyze]

CO3. Outline the design concepts of Distributed File Systems and Distributed Shared memory. [Understand]

CO4. Differentiate between different types of faults and failure recovery techniques in order to implement fault tolerant systems. [Understand]

CO5. Explain the importance of security concepts like transaction and concurrency control in distributed systems. [Understand]

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In Pursuit of Excellence	**Course Delivery Method**	SESSION-2019-2020
		SEM-VII

Name of Subject: Distributed System

Subject Code: RCS 701

Branch: Computer Science & Engineering

Course Plan

Delivery Methods: Chalk & Talk, Power Point Presentation, Tutorials, Solving Numericals, Practicals, assignments, seminar, Brainstorming, Interactive session.

Coverage of

Unit 1 by: - Chalk & Talk, Tutorials, solving numericals, Practicals, assignments.

Unit 2 by: - Chalk & Talk, Power Point Presentation, Tutorials, solving Numericals, assignments and Practicals

Unit 3 by: - Chalk & Talk, Tutorials, assignments, Practicals.

Unit 4 by: - Chalk & Talk, Power Point Presentation, Tutorials, solving assignments, Interactive session.

Unit 5 by: - Chalk & Talk, Tutorials, brain storming question, assignments.

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In Pursuit of Excellence	Mapping	SESSION-2019-2020 SEM-VII

Mapping of Course Outcomes with POs & PSOs:

Sr. No	Course Outcome	PO1	PO 2	PO3	PO 4	PO5	PO6	PO7	PO8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O 2
1	CO 1	2	2	3		1								3	1
2	CO 2	2	2	3		1								3	2
3	CO 3	2	2	2		1								3	2
4	CO 4	2	2	2		1								3	2
5	CO 5	2	2	2		1								3	2
		2	2	2.4		1								3	1.8

CO1. Identify distributed system characteristics and familiar with concepts of logical and vector clocks. [Apply]

CO2. Analyze the advantages and challenges in designing distributed algorithms for different primitives like mutual exclusion and deadlock detection. [Analyze]

CO3. Outline the design concepts of Distributed File Systems and Distributed Shared memory. [Understand]

CO4. Differentiate between different types of faults and failure recovery techniques in order to implement fault tolerant systems. [Understand]

CO5. Explain the importance of security concepts like transaction and concurrency control in distributed systems. [Understand]

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MORADABAD INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

FACULTY: MS. PRACHI GUPTA (PRG)

FACULTY TIME TABLE 2019-20 (ODD SEM)

w.e.f: 02/08/2019 Revised w.e.f: 16/8/2019

L	T	P	TOTAL
6	6	8	20

DAY / TIME	9:00 AM - 10:00 AM	10:00 AM - 11:00 AM	11:00 AM- 12:00 NOON	12:00 AM - 1:00 PM	1:00 PM - 2:00 PM	2:00 PM - 3:00 PM	3:00 PM - 4:00 PM	4:00 PM - 5:00 PM
MONDAY	RCS-751 7^{TH} B1 B-123			RCS-701(L) 7^{TH} C B-307			RCS-701 (T) 7^{TH} C1 B-321	RCS-701 (T) 7^{TH} C3 B-311
TUESDAY			RCS-701(T) 7^{TH} C2 B-307	RCS-701 (L) 7^{TH} B B-321				
WEDNESDAY	RCS-751 7^{TH} C1 B-102		RCS-751 7^{TH} A3 B-102					
THURSDAY	RCS-701(L) 7^{TH} B B-302		RCS-701 (T) 7^{TH} B1 B-307	RCS-701 (L) 7^{TH} C B-309			RCS-751 7^{TH} A2 B-113	
FRIDAY		RCS-701 (L) 7^{TH} C B-311		RCS-701 (L) 7^{TH} B B-321			RCS-701 (T) 7^{TH} B3 B-321	RCS-701 (T) 7^{TH} B2 B-311
SATURDAY								

LUNCH

SUB. CODE	SUBJECT NAME
RCS-701	Distributed System
RCS-751	Distributed System Lab

15/8/19

Kanchan- Deptt. OC

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Mr. Rakesh Kr.Gangwar – OC Time Table

15/8/19

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In Pursuit of Excellence	**Lecture Plan & Course Coverage**	SESSION-2019-2020 SEM-VII

Total Period: 40

SECTION-B

Sr. No.	No. of Periods	Topics/Sub Topics	Reference Books	CO Covered	Planned Date	Coverage Date
1.	1	Brief review of Operating System concepts Characterization of Distributed Systems: Introduction, Examples of distributed Systems	[5]	CO1	2/8/19	3/8/19
2.	1	Resource sharing and the Web Challenges. Bridging: Goals & Basic Design Issues of DS	[5]	CO1	6/8/19	6/8/19
3.	1	Architectural models	[5]	CO1	8/8/19	8/8/19
4.	2	Fundamental Models.	[5]	CO1	9/8/19,13/8/19	9/8/19 13/8/19
5.	1	Theoretical Foundation for Distributed System: Limitation of Distributed system, absence of global clock, shared memory, Logical clocks	[4]	CO1	16/8/19	14/8/19
6.	1	Lamport's logical clock, Vector clocks.	[4]	CO1	20/8/19	16/8/19
7.	1	Concepts in Message Passing Systems: causal order, total order, total causal order	[4]	CO1	22/8/19	20/8/19
8.	2	Techniques for Message Ordering, Causal ordering of messages, global state, termination detection. Beyond: Design Requirements for Distributed Architecture	[4]	CO1	23/8/19, 27/8/19	22/8/19 23/8/19

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9.	1	Review: Basic concept of Mutual Exclusion and its applications Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem	[4]	CO2	29/8/19	27/8/19
10.	4	Token based and non token based algorithms, performance metric for distributed mutual exclusion algorithms.	[4]	CO2	30/8/19, 3/9/19, 5/9/19, 6/9/19	29/8/19 30/8/19 3/9/19 5/9/19
11.	1	Distributed Deadlock Detection: system model, resource Vs communication deadlocks, Deadlock prevention, avoidance, detection & resolution	[4]	CO2	10/9/19	6/9/19
12.		Class Test I			12/9/19, 13/9/19	17/9/19
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13.	2	Centralized dead lock detection	[4]	CO2	17/9/19, 19/9/19	17/9/19 19/9/19
14.	2	Distributed deadlock detection, path pushing algorithms, edge chasing algorithms. Beyond: Deadlock vs Livelock vs Starvation	[4]	CO2	20/9/19, 24/9/19	20/9/19 26/9/19
15.	1	Agreement Protocols: Introduction, System models	[4]	CO3	26/9/19	27/9/19
16.	1	Classification of Agreement Problem, Byzantine agreement problem, Consensus problem, Interactive consistency Problem	[4]	CO3	27/9/19	1/10/19
17.	2	Solution to Byzantine Agreement problem, Application of Agreement problem, Atomic Commit in Distributed Database	[4]	CO3	1/10/19, 3/10/19	3/10/19 4/10/19

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		system.				
18.	2	Distributed Resource Management: Issues in distributed File Systems, Mechanism for Building distributed file systems	[4]	CO3	4/10/19, 8/10/19	10/10/19 11/10/19
19.	2	Design issues in Distributed Shared Memory, Bridging: Shared memory vs Message passing, Algorithm for Implementation of Distributed Shared Memory. Beyond: Case Study of Sun NFS	[4]	CO3	10/10/19, 11/10/19	15/10/19 1/11/19
20.	2	Failure Recovery in Distributed Systems: Concepts in Backward and Forward recovery	[5]	CO4	15/10/19, 17/10/19	5/11/19 8/11/19
21.	2	Recovery in Concurrent systems, Obtaining consistent Checkpoints	[5]	CO4	18/10/19, 22/10/19	8/11/19 15/11/19
22.		Class Test II			24/10/19, 25/10/19	
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23.	1	Recovery in Distributed Database Systems.	[5]	CO4	1/11/19	15/11/19
24.	1	Fault Tolerance: Issues in Fault Tolerance	[5]	CO4	5/11/19	19/11/19
25.	2	Commit Protocols	[5]	CO4	7/11/19, 8/11/19	19/11/19 20/11/19
26.	2	Voting protocols, Dynamic voting protocols.	[5]	CO4	12/11/19, 14/11/19	21/11/19
27.	2	Transactions and Concurrency Control: Transactions, Nested transactions, Locks, Optimistic Concurrency control, Timestamp ordering, Comparison of methods for concurrency control.	[5]	CO5	15/11/19, 19/11/19	21/11/19

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28.	2	Distributed Transactions: Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery.	[5]	CO5	21/11/19, 22/11/19	22/11/19
29.	1	Replication: System model and group communication, Fault - tolerant services, highly available services, Transactions with replicated data.	[5]	CO5	26/11/19	22/11/19
30.		Class Test III			29/11/19, 30/11/19	
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In Pursuit of Excellence	**Lecture Plan & Course Coverage**	SESSION-2019-2020 SEM-VII

Total Period: 40

SECTION-C

Sr. No.	No. of Periods	Topics/Sub Topics	Reference Books	CO Covered	Planned Date	Coverage Date	Sign
1.	1	Brief review of Operating System concepts Characterization of Distributed Systems: Introduction, Examples of distributed Systems	[5]	CO1	2/8/19	3/8/19	
2.	1	Resource sharing and the Web Challenges. Bridging: Goals & Basic Design Issues of DS	[5]	CO1	5/8/19	5/8/19	
3.	1	Architectural models	[5]	CO1	8/8/19	8/8/19	
4.	2	Fundamental Models.	[5]	CO1	9/8/19,12/8/19	9/8/19	
5.	1	Theoretical Foundation for Distributed System: Limitation of Distributed system, absence of global clock, shared memory, Logical clocks	[4]	CO1	16/8/19	16/8/19	
6.	1	Lamport's logical clock, Vector clocks.	[4]	CO1	19/8/19	19/8/19	
7.	1	Concepts in Message Passing Systems: causal order, total order, total causal order	[4]	CO1	22/8/19	22/8/19	
8.	2	Techniques for Message Ordering, Causal ordering of messages, global state, termination detection. Beyond: Design Requirements for Distributed Architecture	[4]	CO1	23/8/19, 26/8/19	23/8/19	

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9.	1	Review: Basic concept of Mutual Exclusion and its applications Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem	[4]	CO2	29/8/19	26/8/19	
10.	4	Token based and non token based algorithms, performance metric for distributed mutual exclusion algorithms.	[4]	CO2	30/8/19, 2/9/19, 5/9/19, 6/9/19	29/8/19 30/8/19 2/9/19	
11.	1	Distributed Deadlock Detection: system model, resource Vs communication deadlocks, Deadlock prevention, avoidance, detection & resolution	[4]	CO2	9/9/19	3/9/19	
12.		Class Test I			12/9/19, 13/9/19		
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13.	2	Centralized dead lock detection	[4]	CO2	16/9/19, 19/9/19	5/9/19	
14.	2	Distributed deadlock detection, path pushing algorithms, edge chasing algorithms. Beyond: Deadlock vs Livelock vs Starvation	[4]	CO2	20/9/19, 23/9/19	6/9/19	
15.	1	Agreement Protocols: Introduction, System models	[4]	CO3	26/9/19	9/9/19	
16.	1	Classification of Agreement Problem, Byzantine agreement problem, Consensus problem, Interactive consistency Problem	[4]	CO3	27/9/19	15/9/19	
17.	2	Solution to Byzantine Agreement problem, Application of Agreement problem, Atomic Commit in Distributed Database	[4]	CO3	30/9/19, 3/10/19	20/9/19 20/9/19	

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		system.					
18.	2	Distributed Resource Management: Issues in distributed File Systems, Mechanism for Building distributed file systems	[4]	CO3	4/10/19, 7/10/19	23/9/19 26/9/19	
19.	2	Design issues in Distributed Shared Memory, Bridging: Shared memory vs Message passing, Algorithm for Implementation of Distributed Shared Memory. Beyond: Case Study of Sun NFS	[4]	CO3	10/10/19, 11/10/19	27/9/19 30/9/19	
20.	2	Failure Recovery in Distributed Systems: Concepts in Backward and Forward recovery	[5]	CO4	14/10/19, 17/10/19	3/10/19 4/10/19	
21.	2	Recovery in Concurrent systems, Obtaining consistent Checkpoints	[5]	CO4	18/10/19, 21/10/19	10/10/19 11/10/19	
22.		Class Test II			24/10/19, 25/10/19		
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23.	1	Recovery in Distributed Database Systems.	[5]	CO4	1/11/19	14/10/19	
24.	1	Fault Tolerance: Issues in Fault Tolerance	[5]	CO4	4/11/19	17/10/19	
25.	2	Commit Protocols	[5]	CO4	7/11/19, 8/11/19	1/11/19 4/11/19	
26.	2	Voting protocols, Dynamic voting protocols.	[5]	CO4	11/11/19, 14/11/19	8/11/19 15/11/19	
27.	2	Transactions and Concurrency Control: Transactions, Nested transactions, Locks, Optimistic Concurrency control, Timestamp ordering, Comparison of methods for concurrency control.	[5]	CO5	15/11/19, 18/11/19	15/11/19 18/11/19	

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28.	2	Distributed Transactions: Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery.	[5]	CO5	21/11/19, 22/11/19	18/11/19 19/11/19	
29.	1	Replication: System model and group communication, Fault - tolerant services, highly available services, Transactions with replicated data.	[5]	CO5	25/11/19	20/11/19 21/11/19	
30.		Class Test III			29/11/19, 30/11/19		
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In Pursuit of Excellence	**Tutorial-1**	SESSION-2019-2020 SEM-VII

Tutorial 1 [CO -1]

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
1.	1	Characterization of Distributed Systems				

1. What is Distributed System? Write down the examples of distributed system. Explain its challenges in brief.
2. What are the Limitations of Distributed System? What could be the impact of absence of Global clock and Shared Memory in distributed systems?
3. What are the types of Distributed System Models?
4. How resource sharing is done in Distributed System?
5. What are the significant advantages of Distributed System?

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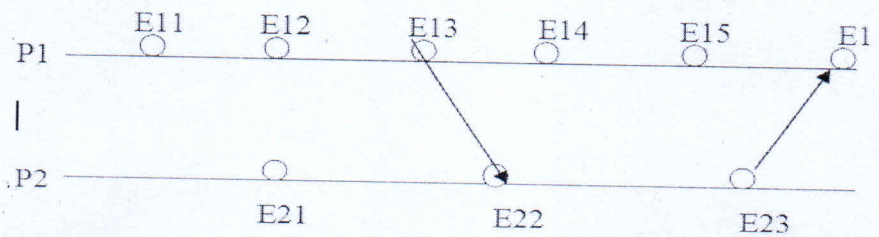
In Pursuit of Excellence	**Tutorial-2**	SESSION-2019-2020 SEM-VII

Tutorial 2 [CO -1]

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
2.	1	Concepts in Message Passing Systems				

1. What are Logical Clocks? Why does a Logical Clock need to be implemented in Distributed System?
2. What is Lamport's logical clock? Describe the important conditions to be satisfied by Lamport's logical clock? What is the limitation of Lamport's clock and how it can be overcome? Explain by drawing the space-time diagram.
3. What are vector clocks? How they maintain causal ordering? What are the advantages of vector clock over Lamport's clock? Explain with the help of implementation rules of vector clocks, how they are implemented?
4. Consider the following space time diagram for two processes P1 and P2. Consider the Lamport's time Stamp for each event. List the events which causally affect the event E22.



5. What is termination detection in distributed system? Explain any algorithm for termination detection. Show that the Huang's Termination detection algorithm detects every true termination in finite time.

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In Pursuit of Excellence	**Tutorial-3**	SESSION-2019-2020 SEM-VII

Tutorial 3 [CO -2]

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
3.	1	Distributed Mutual Exclusion				

1. What do you mean by problem of Mutual Exclusion in Distributed System? What are the requirements of a good Mutual Exclusion Algorithm? What are the metrics to measure the performance of mutual exclusion algorithms?
2. What are the Token Based and Non-Token based Algorithm? Explain Lamport's Algorithm with example.
3. Prove that Maekawa algorithm leads to deadlock state.
4. Prove that Lamport's algorithm and Ricart-Agrawala achieves mutual exclusion.
5. Show that in Lamport's algorithm the critical section is accessed according to the increasing order of timestamps.

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In Pursuit of Excellence	Tutorial-4	SESSION-2019-2020 SEM-VII

Tutorial 4 [CO -2]

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
4.	1	Distributed Deadlock Detection				

1. What is deadlock? Explain the causes of deadlock.
2. What are the drawbacks of centralized deadlock detection algorithm?
3. Explain the control organization for Distributed Deadlock detection. What are advantages of Distributed Control Organization over Centralized Control Organization for Distributed Deadlock Detection?
4. Give the difference between two phase algorithm with one phase algorithm.
5. A centralized Global deadlock detector holds the union of local wait-for graphs. Give an example to explain how a phantom deadlock could be detected if a waiting transaction in a deadlock cycle abort during the deadlock detection procedure.

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In Pursuit of Excellence	**Tutorial-5**	SESSION-2019-2020 SEM-VII

Tutorial 5 [CO -3]

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
5.	1	Agreement Protocols				

1. Write down Lamport Shostak Pease algorithm.
2. What are the performance aspects of agreement protocol.
3. Define the following terms:
   - i) Crash fault
   - ii) Omission fault
   - iii) Malicious fault
4. Write a short note on atomic commit in DDBMS.
5. What is the Agreement Protocol? Discuss the System Model where agreement protocols are used?

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In Pursuit of Excellence	Tutorial-6	SESSION-2019-2020 SEM-VII

Tutorial 6 [CO -3]

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
6.	1	Distributed Resource Management				

1. What do you mean by Distributed File Systems?
2. List out some issues in DFS.
3. Discuss the architecture of a Distributed File Systems. What are the different components of the System Architecture? Explain each in detail.
4. Write the Goals and Requirements of Distributed File Systems.
5. What are the mechanisms for building Distributed File Systems? Discuss mounting, caching and hints in brief.

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In Pursuit of Excellence	Tutorial-7	SESSION-2019-2020 SEM-VII

Tutorial 7 [CO -4]

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
7.	1	Failure and recovery				

1. Differentiate between fault and failure.
2. Define the types of failure.
3. Define forward recovery and backward recovery. List advantages and disadvantages of forward recovery.
4. Explain two approaches of backward error recovery.
5. What do you mean by recovery in concurrent systems/ Explain.

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In Pursuit of Excellence	Tutorial-8	SESSION-2019-2020 SEM-VII

Tutorial 8 [CO -4]

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
8.	1	Fault Tolerance				

1. What are Commit Protocols? Explain how Two-Phase Commit Protocol responds to failure of participating site and failure of coordinator?
2. The Two-phase commit protocol is a Centralized Protocol where the decision to abort or commit is taken by the coordinator. Design a decentralized two-phase commit protocol where no site is designated to be a coordinator.
3. What do you mean by Fault Tolerance? Explain its Services.
4. Fault Tolerance can be achieved by "error processing". Describe and give examples forward recovery, backward recovery and compensation.
5. Compare and contrast static and dynamic vote protocols.

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In Pursuit of Excellence	**Tutorial-9**	SESSION-2019-2020 SEM-VII

Tutorial 9 [CO -5]

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
9.	1	Transactions and Concurrency Control				

1. What is a Transaction? Explain what are its major properties?
2. What are Locks? What are essential differences in the Lock based protocols and Time-Stamp based Protocols?
3. How a non-recoverable situation could arise if write locks are released after the last operation of a transaction but before its commitment.
4. Explain optimistic concurrency control in brief.
5. Explain why Time-Stamping cannot lead to deadlock?

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In Pursuit of Excellence	**Tutorial-10**	SESSION-2019-2020 SEM-VII

Tutorial 10 [CO -5]

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
10.	1	Distributed Transactions				

1. Describe the architecture of replicated transactions.
2. Describe the optimistic concurrency control method. How this method avoids the drawbacks of locking? Explain.
3. What is phantom Deadlock? Describe the conditions for the occurrence of phantom deadlock
4. Why is concurrency control needed?
5. What are the advantages of Data distribution and Data Replication? Explain the terms events and notification?

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In Pursuit of Excellence	ASSIGNMENT - 1	SESSION-2019-2020
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Home Assignments

Unit 1[CO-1]

1. How the distributed computing system is better than parallel processing system? Explain.
2. Define the term transparency. Explain important types of transparencies in distributed system.
3. Discuss the relative advantages and disadvantages of the various commonly used models for configuring distributed computing systems.
4. Discuss the major issues in designing a distributed system.
5. Why is scalability an important feature in the design of distributed system? Discuss some of the guiding principles for designing a scalable distributed system.

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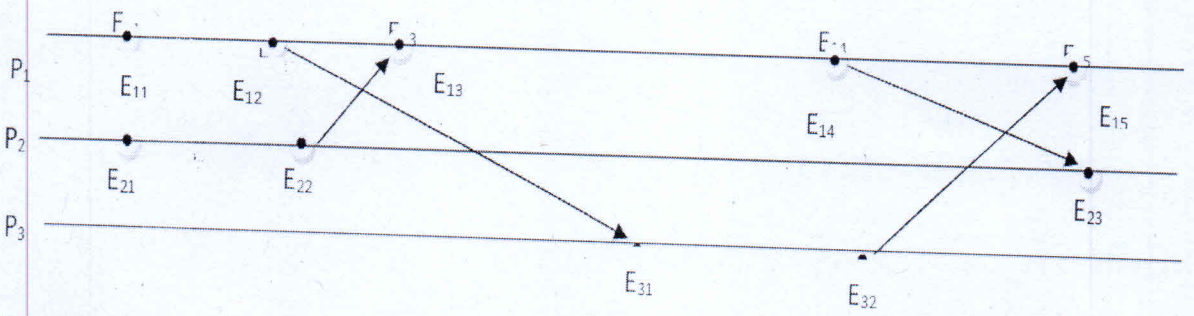
In Pursuit of Excellence	ASSIGNMENT - 2	SESSION-2019-2020 SEM-VII

Unit 1 [CO- 1]

1. Consider the following time-space diagram. Find



i) Vector time stamp of all the events.

ii) Prove or disprove the following sets of events are concurrent.

a) (E_{12} E_{23}) b) (E_{31} E_{14}) c) (E_{22} E_{15})

iii) Prove or disprove that there exists an inconsistent message.

2. Define the following terms:

a) Local state b) Global state c) Consistent global state

d) Transitless global state e) Strongly consistent global state

3. If A and B represent two distinct events in a process and if A->B, then C (A) <C (B). But vice versa is not true. Explain the reason?

4. If process P sends two messages M1 and M2 to another process Q, what problem may arise if the two messages are not received by recipient Q in the order they were sent by process P? Develop an algorithm which guarantees the casual ordering of messages in distributed system?

5. Give the Chandy-lamport's global state recording algorithm.

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In Pursuit of Excellence	**ASSIGNMENT - 3**	SESSION-2019-2020 SEM-VII

Home Assignments

Unit 2[CO-2]

1. How the performance in Maekawa's algorithm increase with respect to Lamport's and Ricart Agrawala algorithm?
2. Show that if synchronization delay is 'T' in Lamport algorithm then the synchronization delay is '2T' in Maekawa's algorithm.
3. Discuss Suzuki-Kasami's broadcast algorithm.
4. Compare the performance of token based algorithm with non token based.
5. Discuss how Maekawa's algorithm fundamentally differs from other algorithms and what problem it does pose.

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In Pursuit of Excellence	ASSIGNMENT - 4	SESSION-2019-2020 SEM-VII

Home Assignments

Unit 2[CO-2]

1. What is the problem of distributed deadlock detection?
2. What are the differences in centralized, distributed and hierarchical control organization for distributed deadlock detection?
3. What are the differences in communication and resource deadlock?
4. What are the shortcomings of Ho-Ramamoorthy's two phase algorithm for deadlock detection?
5. Discuss the issues in deadlock detection and its resolution.

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In Pursuit of Excellence	**ASSIGNMENT - 5**	SESSION-2019-2020 SEM-VII

Home Assignments

Unit 3[CO-3]

1. What are the agreement and validity objective of Byzantine agreement problem?
2. What are Byzantine agreement problem, the consensus problem and iterative consistency protocol?
3. Show that Byzantine agreement always be reached among four processors it two of them are faulty?
4. Explain any one of the application of the agreement problem.

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In Pursuit of Excellence	ASSIGNMENT - 6	SESSION-2019-2020 SEM-VII

Home Assignments

Unit 3[CO-3]

1. Draw and explain the Sun Network File system architecture.
2. Explain in brief in reference with DSM all algorithms used for implementation of shared memory.
3. What is the difference between message passing system and DSM?
4. Discuss the concept of DSM with its architecture.
5. Discuss the advantages of DSM system.

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In Pursuit of Excellence	ASSIGNMENT - 7	SESSION-2019-2020 SEM-VII

Home Assignments

Unit 4[CO-4]

1. Describe in detail method to obtain consistent set of checkpoint.
2. What is checkpointing? Explain the recovery using asynchronous checkpointing scheme.
3. Define the livelocks. What is the difference between a deadlock and livelok?
4. Describe and give examples of forward recovery and backward recovery.
5. Write short note on domino effect.

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Unit 4[CO-4]

1. What are different approaches to fault tolerance?
2. Describe in detail Dynamic voting protocols.
3. What is voting protocol? Explain static voting protocol.

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Home Assignments

Unit 5[CO-5]

1. Compare the concurrency control methods.
2. Explain how a Two-Phase Commit Protocol for nested transaction ensures that if the top level transaction commits all the right descendents are committed or aborted.
3. Explain Transaction Recovery along with an example.
4. What are the different validation conditions for optimistic concurrency control?
5. Write short note on:
    a. Flat and nested transaction along with its structure
    b. 2PL and Strict 2PL.

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In Pursuit of Excellence	**ASSIGNMENT - 10**	SESSION-2019-2020 SEM-VII

Home Assignments

Unit 5[CO-5]

1. What are the advantages and drawback of multiversion timestamp ordering in comparison with the basic timestamp ordering?
2. What are the goals of distributed transaction?

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In Pursuit of Excellence	List of Students	SESSION-2019-2020
		SEM-VII

Computer Science & Engineering — Section -A

S.No.	Student No	Roll No.	Name of Students		Remark
1.	1610362	1608210001	Aarush Gupta		
2.	1610327	1608210002	Aashish Sharma	FW	
3.	1610397	1608210003	Abdul Azeem	FW	
4.	1610420	1608210004	Abhay Vishnoi		
5.	1610386	1608210005	Abhishek Khatri		
6.	1610339	1608210006	Abhishek Kumar		
7.	1610022	1608210007	Abhishek Singh		
8.	1610112	1608210008	Akanksha Gupta		
9.	1610224	1608210009	Akansha Bhatnagar		
10.	1610401	1608210010	Akash Gupta		
11.	1610117	1608210011	Akash Patel	FW	
12.	1610054	1608210012	Akshita Sharma		
13.	1610300	1608210013	Alvina Aslam		
14.	1610063	1608210014	Aman Choudhary		
15.	1610360	1608210015	Aman Dhariwal		
16.	1610382	1608210016	Aman Singh S/O J S		
17.	1610146	1608210017	Aman Singh S/O U S		
18.	1610175	1608210018	Anannya Saxena		
19.	1610425	1608210019	Anirudh Chauhan S/O Ps		
20.	1610336	1608210020	Anirudh Chauhan S/O Skac		
21.	1610007	1608210021	Ankit Agarwal		
22.	1610400	1608210022	Ankit Kumar		
23.	1610226	1608210023	Ankit Verma		
24.	1610065	1608210024	Ankita Saxena		
25.	1610351	1608210025	Anmol Arora		
26.	1610247	1608210026	Anmol Vaish		
27.	1610315	1608210027	Anshika Raj		
28.	1610268	1608210028	Anshul Yadav		
29.	1610194	1608210029	Antra Gupta		
30.	1610044	1608210030	Antriksh Singh		
31.	1610409	1608210031	Anubhav Baliyan		
32.	1610102	1608210032	Anukriti Agarwal		
33.	1610328	1608210033	Anushka Krishnatreya		
34.	1610057	1608210034	Arjun		
35.	1610029	1608210035	Arpit Chauhan		
36.	1610344	1608210036	Arun Kumar Gautam		
37.	1610338	1608210037	Ashi Verma		
38.	1610313	1608210038	Ashish		
39.	1610380	1608210039	Ashish Trivedi		
40.	1610080	1608210040	Ashmit Narayan Rai		
41.	1610235	1608210041	Astha Saxena		
42.	1610178	1608210042	Ayush Gupta		

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44.	1610267	1608210044	Ayushi Gupta		
45.	1610093	1608210045	Ayushi Mathur		
46.	1610002	1608210046	Ayushi Saxena		
47.	1610140	1608210048	Bharat Bajaj		
48.	1610217	1608210050	Deepansh Saran		
49.	1610373	1608210051	Dev Karan Singh		
50.	1610432	1608210052	Devanshu Agarwal		
51.	1610416	1608210053	Devanshu Varshney		
52.	1610384	1608210054	Dhruv Bhatt		
53.	1610050	1608210055	Diti Gupta		
54.	1610040	1608210056	Divyang Mehrotra		
55.	1610387	1608210057	Falak Mujeeb		
56.	1610415	1608210058	Gaurav Yadav		
57.	1610201	1608210059	Geetanjali Wadhwa		
58.	1610394	1608210060	Gunjan Radhawal		
59.	1610445	1608210061	Hannan Tanveer		
60.	1610155	1608210062	Harsh Choudhary	FW	
61.	1610353	1608210063	Harsh Verma		

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62.	2171034	1708210901	Abhiv Kumar Yadav		

Batch No.	S. No. in each section
A-1	1-21
A-2	22-42
A-3	43-Rest

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Munendra Singh

Please enter these name in your register

In Pursuit of Excellence

List of Students

SESSION-2019-2020

SEM-VII

Computer Science & Engineering — Section -B

S.No.	Student No	Roll No.	Name of Students		Remark
1.	1610089	1608210064	Harshita Madhok		
2.	1610103	1608210066	Himanshu Agnihotri		
3.	1610366	1608210068	Hrithik Sisodia		
4.	1610340	1608210069	Isha Sethi	FW	
5.	1610064	1608210070	Jaideep Choudhary		
6.	1610311	1608210071	Juhi Rastogi		
7.	1610402	1608210073	Kshitiz Saxena		
8.	1610303	1608210074	Lalit Gupta		
9.	1610453	1608210075	Manas Munjial		
10.	1610229	1608210076	Manik Agarwal		
11.	1610006	1608210077	Manish Singh Bisht		
12.	1610207	1608210078	Manisha Singh		
13.	1610310	1608210079	Mansi Tyagi		
14.	1610260	1608210080	Milan Vishnoi		
15.	1610246	1608210081	Mohammad Anas		
16.	1610424	1608210082	Mohammad Anzar		
17.	1610354	1608210084	Mohd. Aqdus		
18.	1610348	1608210086	Mohd. Bilal		
19.	1610215	1608210088	Mohd. Tabrez Khan		
20.	1610411	1608210089	Mohd Umar		
21.	1610317	1608210090	Mukti		
22.	1610150	1608210092	Muskan		
23.	1610033	1608210093	Muskan Chaddha		
24.	1610035	1608210094	Muskan Mathur		
25.	1610234	1608210095	Nandni Shishodiya		
26.	1610343	1608210096	Neelendra Kumar		
27.	1610012	1608210097	Neetesh		
28.	1610061	1608210098	Neha Srivastava		
29.	1610111	1608210099	Nidhi Patel		
30.	1610136	1608210100	Nikhil Kumar S/O PK		
31.	1610186	1608210101	Nikhil Kumar S/O RK		
32.	1610206	1608210102	Nimisha		
33.	1610212	1608210103	Nishant Pal		
34.	1610038	1608210104	Nishkarsh Krishan		
35.	1610372	1608210105	Nishtha Varshney		
36.	1610398	1608210106	Nusrat Ali		
37.	1610388	1608210107	Paras Dhawan		
38.	1610271	1608210108	Parth Garg		
39.	1610419	1608210109	Piyush Diwaker		
40.	1610138	1608210110	Piyushi Saraswat		
41.	1610008	1608210111	Prakhar Agarwal		
42.	1610376	1608210112	Prakhar Kumar Gautam		
43.	1610248	1608210113	Prashant Varshney		
44.	1610046	1608210114	Pratham Kumar Singh Rathore		
45.	1610423	1608210115	Pratiksha Sahani		

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47.	1610019	1608210117	Priyam Tyagi		
48.	1610141	1608210118	Puru Raj Singh		
49.	1610056	1608210119	Rachit Gahlot		
50.	1610274	1608210120	Rajat Diwakar		
51.	1610184	1608210122	Rashi Sharma		
52.	1610011	1608210123	Ravi Kumar Sagar		
53.	1610230	1608210124	Reetika Gupta		
54.	1610005	1608210125	Rishabh Agarwal		
55.	1610228	1608210126	Rishabh Chandok		
56.	1610174	1608210127	Rishabh Chauhan	FW	
57.	1610333	1608210128	Rishav Chaba		
58.	1610295	1608210129	Ritik Gupta	FW	

Batch No.	S. No. in each section
B-1	1-18
B-2	19-39
B-3	40-Rest

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In Pursuit of Excellence	List of Students	SESSION-2019-2020 SEM-VII

Computer Science & Engineering — Section -C

S.No.	Student No	Roll No.	Name of Students		Remark
1.	1610034	1608210130	Ritish Varshney		
2.	1610179	1608210131	Ritvik Rastogi		
3.	1610106	1608210133	S.M.Shanawar		
4.	1610236	1608210134	Sachin Singh		
5.	1610059	1608210135	Sakshi Agarwal		
6.	1610024	1608210136	Sakshi Gaur		
7.	1610037	1608210137	Sakshi Saxena		
8.	1610337	1608210138	Samarth Goel		
9.	1610188	1608210139	Sameeksha Vishnoi		
10.	1610312	1608210140	Samra Azeem		
11.	1610399	1608210141	Sarthak Agarwal		
12.	1610048	1608210142	Satyam Agarwal		
13.	1610144	1608210143	Saumya Agarwal		
14.	1610302	1608210145	Shafaque Naz		
15.	1610219	1608210147	Shashank Yadav		
16.	1610115	1608210148	Shipra Dhingra		
17.	1610273	1608210149	Shivam Srivastva		
18.	1610176	1608210150	Shivam Anand		
19.	1610017	1608210151	Shivansh Narayan		
20.	1610440	1608210152	Shreya Mishra		
21.	1610390	1608210153	Shubham		
22.	1610320	1608210154	Shubham Bhatt		
23.	1610216	1608210155	Shubham Chauhan		
24.	1610347	1608210156	Shubham Gupta S/O A.K.G		
25.	1610297	1608210157	Shubham Gupta S/O S.K.G	FW	
26.	1610243	1608210158	Shubham Kumar		
27.	1610437	1608210159	Shubham Kumar Chitransh		
28.	1610272	1608210160	Subham Kumar Singh		
29.	1610257	1608210161	Shubham Sharma		
30.	1610427	1608210162	Shubhi Jain		
31.	1610433	1608210163	Sonali Saxena		
32.	1610377	1608210164	Km Sonam Sehrawat		
33.	1610145	1608210165	Soumya Goel		
34.	1610262	1608210167	Sugandh Sisodia		
35.	1610265	1608210169	Twinkle Rastogi		
36.	1610238	1608210170	Udita Bansal		
37.	1610003	1608210171	Utkarsh Saxena		
38.	1610406	1608210172	Utkarsh Mishra		
39.	1610018	1608210173	Vaibhav Kumar		
40.	1610030	1608210174	Vaishnavi Raman Dwivedi		
41.	1610020	1608210175	Vansh Gupta		
42.	1610051	1608210176	Vardaan Shukla		

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44.	1610016	1608210178	Vedant Saxena		
45.	1610143	1608210180	Vikalp Saxena	FW	
46.	1610197	1608210181	Vikash Kumar		
47.	1610395	1608210182	Vishal		
48.	1610307	1608210183	Vishal Bhatnagar		
49.	1610202	1608210184	Vishal Diwakar		
50.	1610412	1608210185	Vishal Rawat		
51.	1610214	1608210186	Vivek Shrestha		
52.	1610258	1608210187	Yuvraj Singh Rana		
53.	1510564	1508210137	Shubham Saini		
54.	1510060	1508210156	Tarun Srivastava		
55.	1510454	1508210084	Mohd. Shuaib		

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56.	2171012	1708210902	Hardik Kumar Singh		
57.	2171029	1708210903	Kiran		
58.	2171023	1708210904	Fiza Khan		
59.	2171027	1708210905	Megha Gunjan		
60.	2171015	1708210906	Pooja Gola		

Batch No.	S. No. in each section
C-1	1-21
C-2	22-42
C-3	43-Rest

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Moradabad Institute of Technology
Ram Ganga Vihar, Phase-II, Moradabad
4th Year 7th Semester Batch 2016
Computer Science & Engg. **Section A**

RCS 751 Attendance upto 6-Sep-2019

Sno	Roll No.	Name of Student	LAB ATT	LAB HELD
1	1608210022	Ankit Kumar	4	4
2	1608210023	Ankit Verma	3	4
3	1608210024	Ankita Saxena	3	4
4	1608210025	Anmol Arora	1	4
5	1608210026	Anmol Vaish	3	4
6	1608210027	Anshika Raj	2	4
7	1608210028	Anshul Yadav	4	4
8	1608210029	Antra Gupta	0	4
9	1608210030	Antriksh Singh	4	4
10	1608210031	Anubhav Baliyan	3	4
11	1608210032	Anukriti Agarwal	4	4
12	1608210033	Anushka Krishnatreya	2	4
13	1608210034	Arjun	3	4
14	1608210035	Arpit Chauhan	4	4
15	1608210036	Arun Kumar Gautam	4	4
16	1608210037	Ashi Verma	2	4
17	1608210038	Ashish	2	4
18	1608210039	Ashish Trivedi	2	4
19	1608210040	Ashmit Narayan Rai	4	4
20	1608210041	Astha Saxena	4	4
21	1608210042	Ayush Gupta	3	4
22	1608210043	Ayush Rastogi	1	5
23	1608210044	Ayushi Gupta	5	5
24	1608210045	Ayushi Mathur	5	5
25	1608210046	Ayushi Saxena	4	5
26	1608210048	Bharat Bajaj	3	5
27	1608210050	Deepansh Saran	2	5
28	1608210051	Dev Karan Singh	4	5
29	1608210052	Devanshu Agarwal	1	5
30	1608210053	Devanshu Varshney	2	5
31	1608210054	Dhruv Bhatt	4	5
32	1608210055	Diti Gupta	3	5
33	1608210056	Divyang Mehrotra	3	5
34	1608210057	Falak Mujeeb	3	5
35	1608210058	Gaurav Yadav	2	5
36	1608210059	Geetanjali Wadhwa	2	5
37	1608210060	Gunjan Radhawal	3	5
38	1608210061	Hannan Tanveer	2	5
39	1608210062	Harsh Choudhary	2	5
40	1608210063	Harsh Verma	1	5
41	1708210901	Abhiv Kumar Yadav	2	5

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Moradabad Institute of Technology
Ram Ganga Vihar, Phase-II, Moradabad
4th Year 7th Semester Batch 2016
Computer Science & Engg. **Section B**

RCS 701 & RCS 751 Attendance upto 6-Sep-2019

Sno	Roll No.	Name of Student	LEC ATT	TUTE ATT	TOTAL ATT	TOTAL HELD	LAB ATT	LAB HELD
1	1608210064	Harshita Madhok	8	2	10	19	1	4
2	1608210066	Himanshu Agnihotri	7	0	7	19	3	4
3	1608210068	Hrithik Sisodia	6	0	6	19	3	4
4	1608210069	Isha Sethi	5	3	8	19	3	4
5	1608210070	Jaideep Choudhary	6	2	8	19	3	4
6	1608210071	Juhi Rastogi	10	2	12	19	4	4
7	1608210073	Kshitiz Saxena	5	1	6	19	4	4
8	1608210074	Lalit Gupta	4	1	5	19	3	4
9	1608210075	Manas Munjial	10	2	12	19	4	4
10	1608210076	Manik Agarwal	11	3	14	19	3	4
11	1608210077	Manish Singh Bisht	8	2	10	19	4	4
12	1608210078	Manisha Singh	12	2	14	19	4	4
13	1608210079	Mansi Tyagi	11	3	14	19	3	4
14	1608210080	Milan Vishnoi	12	3	15	19	4	4
15	1608210081	Mohammad Anas	11	3	14	19	4	4
16	1608210082	Mohammad Anzar	8	2	10	19	4	4
17	1608210084	Mohd. Aqdus	6	1	7	19	4	4
18	1608210086	Mohd. Bilal	5	2	7	19	1	4
19	1608210088	Mohd. Tabrez Khan	2	0	2	19		
20	1608210089	Mohd Umar	3	0	3	19		
21	1608210090	Mukti	7	1	8	19		
22	1608210092	Muskan	8	2	10	19		
23	1608210093	Muskan Chaddha	8	2	10	19		
24	1608210094	Muskan Mathur	8	2	10	19		
25	1608210095	Nandni Shishodiya	9	2	11	19		
26	1608210096	Neelendra Kumar	10	2	12	19		
27	1608210097	Neetesh	9	2	11	19		
28	1608210098	Neha Srivastava	8	1	9	19		
29	1608210099	Nidhi Patel	2	1	3	19		
30	1608210100	Nikhil Kumar S/O PK	9	3	12	19		
31	1608210101	Nikhil Kumar S/O RK	8	3	11	19		
32	1608210102	Nimisha	5	1	6	19		
33	1608210103	Nishant Pal	7	0	7	19		
34	1608210104	Nishkarsh Krishan	8	3	11	19		
35	1608210105	Nishtha Varshney	8	1	9	19		
36	1608210106	Nusrat Ali	5	1	6	19		
37	1608210107	Paras Dhawan	9	4	13	19		
38	1608210108	Parth Garg	4	0	4	19		
39	1608210109	Piyush Diwaker	11	2	13	19		
40	1608210110	Piyushi Saraswat	9	2	11	19		
41	1608210111	Prakhar Agarwal	6	1	7	19		
42	1608210112	Prakhar Kumar Gautam	7	0	7	19		
43	1608210113	Prashant Varshney	12	2	14	19		
44	1608210114	Pratham Kumar Singh Rathore	7	1	8	19		
45	1608210115	Pratiksha Sahani	9	2	11	19		
46	1608210116	Prerna Arya	9	2	11	19		
47	1608210117	Priyam Tyagi	12	2	14	19		
48	1608210118	Puru Raj Singh	10	2	12	19		
49	1608210119	Rachit Gahlot	3	1	4	19		
50	1608210120	Rajat Diwakar	6	1	7	19		
51	1608210122	Rashi Sharma	10	2	12	19		
52	1608210123	Ravi Kumar Sagar	3	0	3	19		
53	1608210124	Reetika Gupta	9	2	11	19		
54	1608210125	Rishabh Agarwal	9	3	12	19		
55	1608210126	Rishabh Chandok	5	0	5	19		
56	1608210127	Rishabh Chauhan	12	3	15	19		
57	1608210128	Rishav Chaba	10	2	12	19		
58	1608210129	Ritik Gupta	12	2	14	19		

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Moradabad Institute of Technology
Ram Ganga Vihar, Phase-II, Moradabad
4th Year 7th Semester Batch 2016
Computer Science & Engg. **Section C**

RCS 701 & RCS 751 Attendance upto 6-Sep-2019

Sno	Roll No.	Name of Student	LEC ATT	TUTE ATT	TOTAL ATT	TOTAL HELD	LAB ATT	LAB HELD
1	1608210130	Ritish Varshney	3	2	5	18	3	5
2	1608210131	Ritvik Rastogi	11	3	14	18	4	5
3	1608210133	S.M.Shanawar	7	3	10	18	1	5
4	1608210134	Sachin Singh	5	2	7	18	4	5
5	1608210135	Sakshi Agarwal	6	1	7	18	4	5
6	1608210136	Sakshi Gaur	8	2	10	18	3	5
7	1608210137	Sakshi Saxena	8	2	10	18	2	5
8	1608210138	Samarth Goel	7	2	9	18	3	5
9	1608210139	Sameeksha Vishnoi	8	4	12	18	4	5
10	1608210140	Samra Azeem	9	4	13	18	4	5
11	1608210141	Sarthak Agarwal	8	2	10	18	3	5
12	1608210142	Satyam Agarwal	6	2	8	18	3	5
13	1608210143	Saumya Agarwal	9	3	12	18	5	5
14	1608210145	Shafaque Naz	7	1	8	18	2	5
15	1608210147	Shashank Yadav	5	0	5	18	2	5
16	1608210148	Shipra Dhingra	4	2	6	18	3	5
17	1608210149	Shivam Srivastva	9	3	12	18	3	5
18	1608210150	Shivam Anand	10	3	13	18	3	5
19	1608210151	Shivansh Narayan	9	3	12	18	3	5
20	1608210152	Shreya Mishra	9	4	13	18	4	5
21	1608210153	Shubham	8	2	10	18	3	5
22	1608210154	Shubham Bhatt	6	0	6	19		
23	1608210155	Shubham Chauhan	10	0	10	19		
24	1608210156	Shubham Gupta S/O A.K.G	11	0	11	19		
25	1608210157	Shubham Gupta S/O S.K.G	8	2	10	19		
26	1608210158	Shubham Kumar	6	2	8	19		
27	1608210159	Shubham Kumar Chitransh	8	0	8	19		
28	1608210160	Subham Kumar Singh	6	1	7	19		
29	1608210161	Shubham Sharma	12	1	13	19		
30	1608210162	Shubhi Jain	6	3	9	19		
31	1608210163	Sonali Saxena	5	1	6	19		
32	1608210164	Km Sonam Sehrawat	7	0	7	19		
33	1608210165	Soumya Goel	9	1	10	19		
34	1608210167	Sugandh Sisodia	9	1	10	19		
35	1608210169	Twinkle Rastogi	9	0	9	19		
36	1608210170	Udita Bansal	8	2	10	19		
37	1608210171	Utkarsh Saxena	3	1	4	19		
38	1608210172	Utkarsh Mishra	9	0	9	19		
39	1608210173	Vaibhav Kumar	5	1	6	19		
40	1608210174	Vaishnavi Raman Dwivedi	4	1	5	19		
41	1608210175	Vansh Gupta	3	1	4	19		
42	1608210176	Vardaan Shukla	10	0	10	19		
43	1608210177	Varun Kumar Tomar	11	4	15	18		
44	1608210178	Vedant Saxena	13	4	17	18		
45	1608210180	Vikalp Saxena	10	3	13	18		
46	1608210181	Vikash Kumar	10	2	12	18		
47	1608210182	Vishal	12	4	16	18		
48	1608210183	Vishal Bhatnagar	6	1	7	18		
49	1608210184	Vishal Diwakar	5	3	8	18		
50	1608210185	Vishal Rawat	7	1	8	18		
51	1608210186	Vivek Shrestha	12	4	16	18		
52	1608210187	Yuvraj Singh Rana	11	2	13	18		
53	1508210137	Shubham Saini	2	0	2	18		
54	1508210156	Tarun Srivastava	2	0	2	18		
55	1508210084	Mohd. Shuaib	2	0	2	18		
56	1708210902	Hardik Kumar Singh	5	2	7	18		
57	1708210903	Kiran	3	1	4	18		
58	1708210904	Fiza Khan	6	2	8	18		
59	1708210905	Megha Gunjan	9	4	13	18		
60	1708210906	Pooja Gola	8	3	11	18		

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In Pursuit of Excellence	**List of Students having short attendance**	SESSION-2019-2020 SEM-VII

1608210066	Himanshu Agnihotri	36.84	
1608210068	Hrithik Sisodia	31.58	
1608210073	Kshitiz Saxena	31.58	
1608210074	Lalit Gupta	26.32	
1608210084	Mohd. Aqdus	36.84	
1608210086	Mohd. Bilal	36.84	
1608210088	Mohd. Tabrez Khan	10.53	
1608210089	Mohd Umar	15.79	
1608210099	Nidhi Patel	15.79	
1608210102	Nimisha	31.58	
1608210103	Nishant Pal	36.84	
1608210106	Nusrat Ali	31.58	
1608210108	Parth Garg	21.05	
1608210111	Prakhar Agarwal	36.84	
1608210112	Prakhar Kumar Gautam	36.84	
1608210119	Rachit Gahlot	21.05	
1608210120	Rajat Diwakar	36.84	
1608210123	Ravi Kumar Sagar	15.79	
1608210126	Rishabh Chandok	26.32	

Dr. Somesh Kumar
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MORADABAD INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE & ENGG
CLASS TEST I
SET I

Course: B.Tech.
Session: 2019- 20
Subject: DISTRIBUTED SYSTEM
Max. Marks: 15

Semester: 7th
Section: A,B,C
Subject Code: RCS-701
Time: 1:15 Hrs

Q.No. :	1	2	3	4	5	6
CO No. :	1	1	1	1	2	2

Section A (10 Marks)

Q1. Define three properties of distributed systems — 2 Marl

Q2. How can a proxy server and cache can help in increasing availability and performance of a distributed system? — 2 Marl

Q3. Define — 3 Marl
i) Consistent Global State
ii)Transitless Global State
iii) Strongly Consistent Global State

Q4. Define vector clocks along with their correctness conditions and implementation rules. — 3 Marl

Section B (10 Marks)

Q5. What is Distributed Mutual Exclusion? — 2 Marl

Q6. What are the metrics to measure the performance of mutual exclusion algorithms? — 2 Marl

ALL THE BEST

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MORADABAD INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE & ENGG
CLASS TEST I
SET II

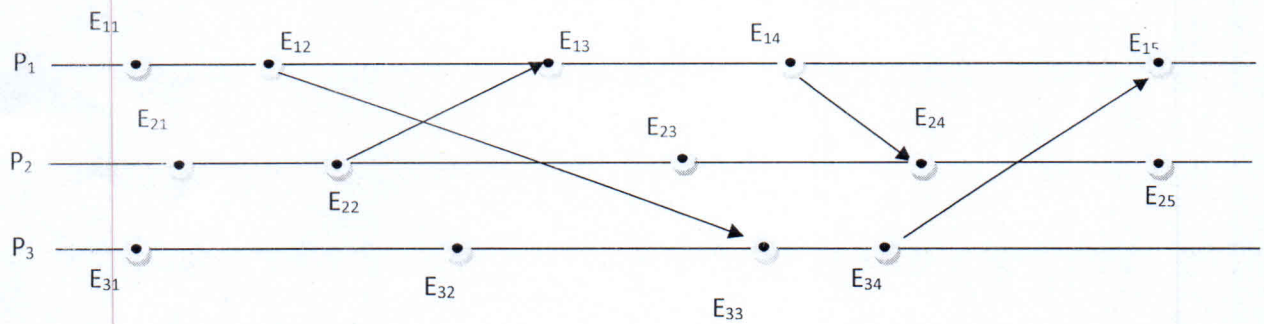
Course: B.Tech. | **Semester: 7th**
Session: 2019- 20 | **Section: A,B,C**
Subject: DISTRIBUTED SYSTEM | **Subject Code: RCS-701**
Max. Marks: 15 | **Time: 1:15 Hrs**

Q.No. :	1	2	3	4	5	6
CO No. :	1	1	1	1	2	2

Q1. Explain Distributed System model. 2 Mark

Q2. Explain the limitations of distributed system with example. 2 Mark

Q3. Consider the following time-space diagram. Find Vector Time Space of all events. 2 Mark



Q4. What are Lamport logical clocks? List the important conditions to be satisfied by Lamport logical clocks. Discuss the limitations of Lamport logical clocks. 4 Mark

Q5. State the classification of distributed mutual exclusion algorithms. What is requirement of mutual exclusion algorithm? 3 Mark

Q6. How distributed Mutual Exclusion is different from mutual exclusion in single computer system? How the performance of mutual exclusion algorithm is measured? 2 Mark

OR

Justify how the Ricart-Agarwala mutual exclusion Algorithm is an optimized version of Lamport's mutual exclusion Algorithm.

ALL THE BEST

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MORADABAD INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE & ENGG
CLASS TEST I SOLUTION
SET II

Course: B.Tech. **Semester: 7th**
Session: 2019- 20 **Section: A,B,C**
Subject: DISTRIBUTED SYSTEM **Subject Code: RCS-701**

Q.No. :	1	2	3	4	5	6
CO No. :	1	1	1	1	2	2

Q1. Explain Distributed System model.

Ans-1. Systems in real world environments should be designed to function correctly and smoothly in every circumstances and in the face of many possible difficulties & threats. The common **properties and design issues of DS are in the form of descriptive models**. These models are:

1) Architectural Models: An architectural model of a DS is concerned with the placement of its parts & the relationships between them. Examples include the client-server model and the peer-to-peer model.

2) Fundamental Model: A fundamental Model is concerned with a more formal description of the properties that are common in all of the architectural models.

There is no global time in a DS, so the clocks on different computers do not necessarily give the same time as one another. All communication between processes is achieved by means of messages. Message communication over a computer network can be affected **by delays**, can suffer from a **variety of failures** and is vulnerable **to security attacks**. These issues are addressed by three models:

1. The **Interaction Model** deals with performance and with the difficulty of setting time limits in a DS, for example for message delivery.
2. The **Failure Model** attempts to give a precise specification of the faults that can be exhibited by processes and communication channels. It defines reliable communication and correct processes.
3. The **Security Model** discusses the possible threats to processes and communication channels. It introduces the concept of a secure channel, which is secure against those threats.

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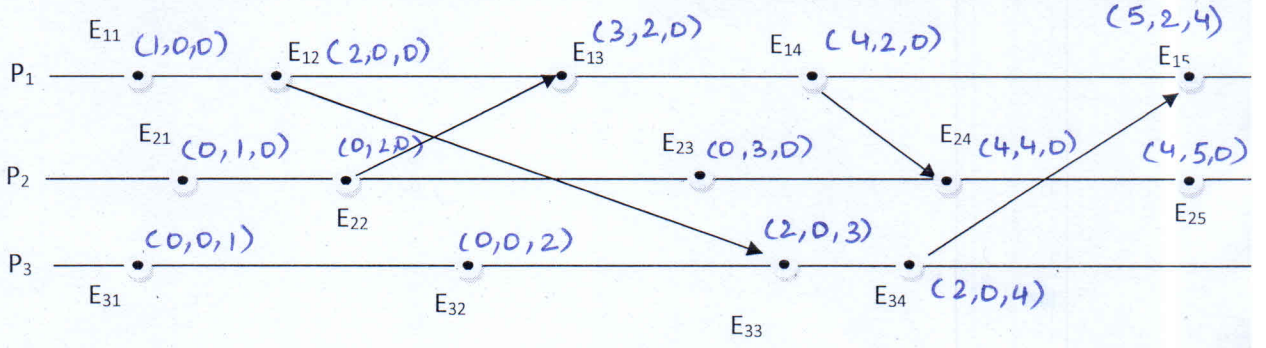
Q.2. Explain the limitations of distributed system with example.

A.2. The limitations of distributed system are:

- **Concurrency :** In a network of computers concurrent program execution is the norm. I can do my work on my computer while you do your work on yours, sharing resources such as web pages or files when necessary.
- **No Global Clock :** When programs need to cooperate, they coordinate their actions by exchanging messages. Close coordination depends on a shared idea. But it turns out that there are limits to the accuracy with which the computers in a network can synchronize their clocks- there is no single notion of the current time.
- **Independent Failure:** - All computer systems can fail and it is the responsibility of system designers to plan for the consequences of possible failures. Each components of the system can fail independently, leaving the others still running.

Q3. **Consider the following time-space diagram. Find Vector Time Space of all events**



Q.4. What are Lamport logical clocks? List the important conditions to be satisfied by Lamport logical clocks. Discuss the limitations of Lamport logical clocks.

A.4. Due to absence of perfectly synchronized clocks & global time, order in which two events occur at two different computers cannot be determined based on local time at which they occur. Lamport proposed a clock scheme to order events in a DS using logical clocks.

Conditions satisfied by the system of clocks

If $a \rightarrow b$ then $C(a) < C(b)$

[C1] : For any 2 events a & b in process P_i ,if a occurs before b, then

$$C_i(a) < C_i(b)$$

[C2] : If a is event of sending message m in a process P_i & b is event of receiving same message m at P_j then $C_i(a) < C_j(b)$

Limitations of Lamport logical clock

If **a→b** then **C(a) < C(b).** However reverse is not necessarily true If events have occurred in different processes i.e. **C(a) < C(b)** then **a→b** is not necessarily True. Events **a** & **b** may be causally related or may not be causally related.

In Lamport's system of clocks we can guarantee if **C(a) < C(b)** then **b** **a** (i.e. the future cannot influence the past). However we cannot say whether events **a** & **b** are causally related

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or not (i.e. whether there exists a path between **a** and **b** that moves only forward along the time axis in space-time diagram)by just looking at the timestamps of events

- **If a→b , C(a) < C(b)**
- **If C(a) < C(b) a→b may or may not be**

Q.5. State the classification of distributed mutual exclusion algorithms. What is requirement of mutual exclusion algorithm?

A.5. Classification of Mutual Exclusion Algorithms :- The algorithms can be grouped into two classes.

1. **Non-Token Based:** These algorithms require two or more successive rounds of message exchanges among the sites.

- These algorithms are assertion based because a site can enter its **CS (Critical Section)** when an assertion defined on its local variables become true. Mutual exclusion is enforced because assertion becomes true only at one site at any given time.
- Uses timestamps to differentiate between old and current requests.
- **E.g.**
  a) **Lamport's Algorithm**
  b) **The Ricart- Agrawala Algorithm**
  c) **Maekawa's Algorithm**

2. **Token-Based** : In these algorithms a unique token (also known as **PRIVILEGE** message) is shared among the sites. A site is allowed to enter its **CS** if it possesses the token and it continues to hold the token until the execution of the **CS** is over.

- Single token circulates, site enter **CS** when token is present.
- Mutual exclusion is ensured because the token is unique.
- Algorithms differ in how to find and get the token.
- Uses sequence numbers rather than timestamps to differentiate between old and current requests.
- E.g.
  a) Suzuki- Kasami's Broadcast Algorithm
  b) Singhal's Heuristic Algorithm
  c) Raymond's tree- based Algorithm
- **Requirements of Mutual Exclusion Algorithms :** The primary objective of a mutual exclusion algorithm is to maintain mutual exclusion i.e. to guarantee that only one request access the **CS** at time. In addition, the following characteristics are considered important.

a) **Freedom from Deadlocks :-** Two or more sites should not endlessly wait for messages that will never arrive.

b) **Freedom from Starvation :-** A site should not be forced to wait indefinitely to execute **CS** while other site are repeatedly executing **CS**. That is every requesting site should get an opportunity to execute **CS** in a finite time.

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c) **Fairness-** It dictates that requests must be executed in the order they are made or the order in which they arrive in the system. Fairness implies freedom from starvation.

d) **Fault tolerance-** A mutual exclusion algorithm is fault tolerant if in the wake of a failure, it can reorganize itself so that it continues to function without any disruptions.

Q.6a. How distributed Mutual Exclusion is different from mutual exclusion in single computer system? How the performance of mutual exclusion algorithm is measured?

Single Computer System	Distributed System
The status of a shared resource & user is readily available in the shared memory	Both the shared resources & the users may be distributed
Solutions to Mutex problems can be easily implemented using shared variable	Shared memory does not exist.
Shared variable based approaches can be used in this system	Message passing based approaches is used.
Mutex is simple to implement in Single Computer System.	Mutex is complex to implement in Distributed System.

The performance of mutual exclusion algorithm is generally measured by the following 4 metrics.

a) Number of messages – necessary per CS invocation.

b) Synchronization Delay- The time required after a site leaves the CS and before the next site enters CS.

c) Response Time- The time interval, a request waits for its CS execution to be over after its request messages have been sent out.

d) System Throughput- The rate at which the system executes requests for the CS. If sd is the synchronization delay and E is the average critical section execution time , then

- System throughput = 1 / (sd + E)

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Q.6b. Justify how the Ricart-Agarwala mutual exclusion Algorithm is an optimized version of Lamport's mutual exclusion Algorithm.

- A.6b. The Ricart- Agrawala Algorithm: It is an optimization of Lamport's algorithm that dispenses with RELEASE messages by cleverly merging them with REPLY Messages. In this algorithm also : $\forall i : 1 \leq i \leq N :: R_i = \{S_1, S_2, \ldots\ldots\ldots\ldots, S_N\}$ **The Algorithm :**

1. Requesting the critical section

a) When a site S_i wants to enter the **CS**, it sends a timestamped **REQUEST** message to all the sites in its request set.

b) When site S_j receives a **REQUEST** message from site S_i , it sends a **REPLY** message to site S_i if site S_j is neither requesting nor executing the **CS** or if site S_j is requesting and S_i's request's timestamp is smaller than site S_j's own request's timestamp. The request is deferred otherwise.

2. Executing the critical section

- Site S_i enters the **CS** after it has received **REPLY** messages from the sites in its request set.

3. Releasing the critical section

- When site **Si** exits the **CS**, it sends **REPLY** message to all the deferred requests.
- **Performance :** This algorithm requires **2(N-1)** messages per **CS** execution. (N-1) REQUEST and (N-1) REPLY messages. Where N is the number of cooperating processes.

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Subject Teacher.....Ms. Prachi Gupta

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ATTENDANCE SHEET

Session: 2019-20 | Class Test I / II / III

Date: 13/09/19 | Shift: 2nd | Room No: C-302

Year: 4th | Semester: 7th | Section/Branch: B

Subject Name: Distributed System | Subject Code: RCS-701

S. No	Roll No.	Name of Student		Branch	Signature
1.	1608210069	Isha Sethi	13	CSE	Isha
2.	1608210070	Jaideep Choudhary	4	CSE	Jaideep Choudhary
3.	1608210071	Tulsi Pastogi	12	CSE	Tulsi
4.	1608210073	Kshitiz Saxena	01	CSE	Kshitiz
5.	1608210075	Manas Munjial	9	CSE	Manas
6.	1608210076	Manik Agarwal	6	CSE	Manik
7.	1608210077	Manish Singh Bisht	10	CSE	Manish
8.	1608210078	Manisha Singh	11	CSE	Manisha
9.	1608210079	Mansi Tyagi	13	CSE	mansityagi
10.	1608210080	Milan Vishnoi	12	CSE	Milan Vishnoi
11.	1608210081	Mohammad Anas	8	CSE	Anas
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Total No. of Students allotted in Room: 15 | Students Absent: 04 | Students Present: 11

Invigilators: 1) Name Ukanesh Sharma Sign:

2) Name Sandeep Kumar Sign:

40

Subject Teacher: Ms. Prachi Gupta

MIT Group of Institutions, Moradabad

ATTENDANCE SHEET

Session: 2019-20 | Class Test I / II / III ✓

Date: 13/09/19 | Shift: 2nd | Room No: C-305

Year: 4th | Semester: 7th | Section/Branch: B/CSE

Subject Name: Distributed Systems | Subject Code: RCS-701

S. No	Roll No.	Name of Student	Branch	Signature
1.	1608210107	Paras Dhawan	CSE	Paras
2.	1608210109	Piyush Diwaker	CSE	Piyush
3.	1608210110	Piyushi Saraswat	CSE	Piyushi
4.	1608210105	Nishtha Varshney	CSE	Nishtha
5.	1608210104	Nishkarsh Krishan	CSE	NK
6.	1608210103	Nishant Pal	CSE	Nish
7.	1608210097	Nootash	CSE	Absent
8.	1608210098	Neha Srivastava	CSE	
9.	1608210100	Nikhil Kumar II	CSE	Nikhil
10.	1608210101	Nikhil Kumar II	CSE	Nikhil
11.	1608210095	Nandni	CSE	Nandni
12.	1608210094	Muskan Mathur	CSE	muskan
13.	1608210092	Muskan	CSE	Muskan
14.	1608210090	MUKTI	CSE	Mukti
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Moradabad-244001

Total No. of Students allotted in Room: 16 | Students Absent: 02 | Students Present: 14

Invigilators: 1) Name _____ Sign: _____

2) Name Dr. Sangeeta Mehrl Sign: _____

FB

Subject Teacher: Mrs. Prachi Gupta

MIT Group of Institutions, Moradabad

ATTENDANCE SHEET

Session: 2019-20

Class Test I / II / III ✓ Ist

Date: 13.09.2019 Shift: IInd Room No: C-306

Year: 4th Semester: 7th Section/Branch: B/CS

Subject Name: Distributed Systems Subject Code: RCS-701

S. No	Roll No.	Name of Student	Branch	Signature
1.	1608210113	Prashant varshney	C.S.E.	Prashant
2.	1608210114	Pratham Rathore	CSE	[illegible]
3.	1608210115	Pratiksha Sahani	CSE	[illegible]
4.	1608210116	Prerna Arya	CSE	Prerna
5.	1608210117	Priyam Tyagi	CS	Priyam
6.	1608210118	Punu Raj Singh	C.S	Punu Raj
7.	1608210120	Rajat Diwakar	CSE	Rajat
8.	1608210122	Rashi Sharma	CSE	Rashi
9.	1608210124	Ritika Gupta	CS	Ritika
10.	1608210125	Rishabh Agarwal	CS	Agarwal
11.	1608210127	Rishabh Chauhan	CS	Rishabh
12.	1608210128	Rishav Chaba	CS	Rishav
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Total No. of Students allotted in Room: 13 Students Absent: 01 Students Present: 12

Invigilators: 1) Name Saurabh Saxena Sign: Sau. Sax

2) Name Sign:

Subject Teacher: Mrs. Prachi Gupta

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ATTENDANCE SHEET

Session: 2019-2020 | Class Test I / II / III ✓

Date: 13/09/2019 | Shift: IInd | Room No: A-303

Year: 4th | Semester: 7th | Section/Branch: C/CS

Subject Name: Distributed System | Subject Code: RCS-701

S. No	Roll No.	Name of Student		Branch	Signature
1.	1608210131	Rutvik Rautogi	13	CSE	Rutvik
2.	1608210136	Sakshi Gaur	14	CSE	Sakshi
3.	1608210137	Sakshi Saxena	11	CSE	Sakshi
4.	1608210138	Samarth Goel	9	CSE	Sam
5.	1608210139	Sameeksha Vishnoi	05	CSE	Sam.
6.	140	Samra Azeem	13	CSE	Samra
7.	1608210141	Sarthak Agarwal	13	CSE	S
8.	1608210143	Saumya Agarwal	9	CSE	Sa.
9.	1608210150	Shivam Anand	8	CSE	Shivam
10.	1608210152	Shreya Mishra	9	CSE	Shreya
11.					
12.	1608210142	— ABSENT			
13.	1608210149	— ABSENT			
14.	1608210151	— ABSENT			
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Moradabad-244001

Total No. of Students allotted in Room: 13 | Students Absent: 03 | Students Present: 10

Invigilators: 1) Name Dr. Nitin Kumar Agrawal | Sign:

2) Name Dr. Harendra Kumar | Sign:

Subject Teacher..... Ms. Prachi Gupta

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ATTENDANCE SHEET

Session: 2019-20 | Class Test I / II / III

Date: 13/9/19 | Shift: 2nd | Room No: A-307

Year: 4th | Semester: 7th | Section/Branch: A/CS

Subject Name: Distributed System | Subject Code: RCS-701

S. No	Roll No.	Name of Student		Branch	Signature
1.	1608210153	Shubham	10	C.S.E	Shubham
2.	1608210155	Shubham chauhan	10	CSE	
3.	1608210156	Shubham Gupta I	7	CSE	Shu
4	1608210159	Shubham Kumar Chitransh	04	"	Shubham
5.	1608210161	Shubham sharma	04	CSE	Shubham
6.	1608210162	Shubhi Jain	14	CSE	Shubhi Jain
7.	1608210169	Twinkle	10	CSE	Twinkle
8.	1608210167	Suganth Sisodia	12	CSE	Suganth
9.	1608210165	Soumya Goel	12	CSE	Soumya
10.	1608210172	Utkarsh Mishra	7	CSE	Utkarsh
11.	1608210170	Udita Bansal	11	CSE	Udita
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Total No. of Students allotted in Room: 14 | Students Absent: 03 | Students Present: 11

Invigilators: 1) Name Kanchan Sign: Kalpa

2) Name Richa Saxena Sign:

Subject Teacher: Ms. Ruchi gupta

MIT Group of Institutions, Moradabad

ATTENDANCE SHEET

Session: 2019-20

Class Test I / II / III

Date: 13/09/19 Shift: 2nd Room No: B-306

Year: 4th Semester: 07th Section/Branch: C

Subject Name: Distributed System Subject Code: RCS-701

S. No.	Roll No.	Name of Student		Branch	Signature
1.	1608210176		ABSENT		
2.	1608210177	Varun Kr Tomar	12	CS	Varun
3.	1608210178	Vedant Saxena	8	CS	Saxena
4.	1608210180	Vikalp Saxena	5	"	Vikalp
5.	1608210181		ABSENT		
6	1608210182	Vishal	2	CS	Vishal
7.	1608210186		ABSENT		
8.	1608210187	Yuvraj Singh Rana	6	CS	Yuvraj
9.	1708210902		ABSENT		
10.	1708210904	Riza Khan	0	CS	Fiza Khan
11.	1708210905	Megha Gunjan	5	CS	Megha
12.	1708210906	Pooja Gola	14	"	Pooja
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Total No. of Students allotted in Room: 12 Students Absent: 04 Students Present: 08

Invigilators: 1) Name Dr. Pratosh Kr Awasthi Sign:

2) Name Dr. Neelaksh Sheel Sign: 13/9/19

MORADABAD INSTITUTE OF TECHNOLOGY, Moradabad
4th Year 7th Sem 2016-20 Batch
Computer Science & Engineering Section B
Distributed System RCS-701
CT-1 MARKS

Sno.	Roll No.	Name of Students	CT-1
1	1608210064	Harshita Madhok	A
2	1608210066	Himanshu Agnihotri	
3	1608210068	Hrithik Sisodia	A
4	1608210069	Isha Sethi	13
5	1608210070	Jaideep Choudhary	4
6	1608210071	Juhi Rastogi	12
7	1608210073	Kshitiz Saxena	1
8	1608210074	Lalit Gupta	
9	1608210075	Manas Munjial	9
10	1608210076	Manik Agarwal	6
11	1608210077	Manish Singh Bisht	10
12	1608210078	Manisha Singh	11
13	1608210079	Mansi Tyagi	13
14	1608210080	Milan Vishnoi	12
15	1608210081	Mohammad Anas	8
16	1608210082	Mohammad Anzar	A
17	1608210084	Mohd. Aqdus	A
18	1608210086	Mohd. Bilal	
19	1608210088	Mohd. Tabrez Khan	
20	1608210089	Mohd Umar	
21	1608210090	Mukti	1
22	1608210092	Muskan	6
23	1608210093	Muskan Chaddha	A
24	1608210094	Muskan Mathur	10
25	1608210095	Nandni Shishodiya	8
26	1608210096	Neelendra Kumar	A
27	1608210097	Neetesh	5
28	1608210098	Neha Srivastava	
29	1608210099	Nidhi Patel	7
30	1608210100	Nikhil Kumar S/O PK	5
31	1608210101	Nikhil Kumar S/O RK	9
32	1608210102	Nimisha	
33	1608210103	Nishant Pal	8
34	1608210104	Nishkarsh Krishan	7
35	1608210105	Nishtha Varshney	10
36	1608210106	Nusrat Ali	
37	1608210107	Paras Dhawan	12
38	1608210108	Parth Garg	
39	1608210109	Piyush Diwaker	3
40	1608210110	Piyushi Saraswat	10
41	1608210111	Prakhar Agarwal	
42	1608210112	Prakhar Kumar Gautam	14
43	1608210113	Prashant Varshney	13
44	1608210114	Pratham Kumar Singh Rathore	11
45	1608210115	Pratiksha Sahani	9
46	1608210116	Prerna Arya	10
47	1608210117	Priyam Tyagi	4
48	1608210118	Puru Raj Singh	10
49	1608210119	Rachit Gahlot	
50	1608210120	Rajat Diwakar	7
51	1608210122	Rashi Sharma	6
52	1608210123	Ravi Kumar Sagar	
53	1608210124	Reetika Gupta	14
54	1608210125	Rishabh Agarwal	6
55	1608210126	Rishabh Chandok	
56	1608210127	Rishabh Chauhan	12
57	1608210128	Rishav Chaba	13
58	1608210129	Ritik Gupta	A

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MORADABAD INSTITUTE OF TECHNOLOGY, Moradabad
4th Year 7th Sem 2016-20 Batch
Computer Science & Engineering Section C
Distributed System RCS-701
MARKS CT-1

Sno.	Roll No.	Name of Students	Marks
1	1608210130	Ritish Varshney	
2	1608210131	Ritvik Rastogi	13
3	1608210133	S.M.Shanawar	
4	1608210134	Sachin Singh	
5	1608210135	Sakshi Agarwal	
6	1608210136	Sakshi Gaur	14
7	1608210137	Sakshi Saxena	11
8	1608210138	Samarth Goel	9
9	1608210139	Sameeksha Vishnoi	5
10	1608210140	Samra Azeem	13
11	1608210141	Sarthak Agarwal	13
12	1608210142	Satyam Agarwal	A
13	1608210143	Saumya Agarwal	9
14	1608210145	Shafaque Naz	
15	1608210147	Shashank Yadav	
16	1608210148	Shipra Dhingra	
17	1608210149	Shivam Srivastva	A
18	1608210150	Shivam Anand	8
19	1608210151	Shivansh Narayan	A
20	1608210152	Shreya Mishra	9
21	1608210153	Shubham	10
22	1608210154	Shubham Bhatt	
23	1608210155	Shubham Chauhan	10
24	1608210156	Shubham Gupta S/O A.K.G	7
25	1608210157	Shubham Gupta S/O S.K.G	A
26	1608210158	Shubham Kumar	
27	1608210159	Shubham Kumar Chitransh	4
28	1608210160	Subham Kumar Singh	
29	1608210161	Shubham Sharma	4
30	1608210162	Shubhi Jain	14
31	1608210163	Sonali Saxena	A
32	1608210164	Km Sonam Sehrawat	A
33	1608210165	Soumya Goel	12
34	1608210167	Sugandh Sisodia	12
35	1608210169	Twinkle Rastogi	10
36	1608210170	Udita Bansal	11
37	1608210171	Utkarsh Saxena	
38	1608210172	Utkarsh Mishra	7
39	1608210173	Vaibhav Kumar	
40	1608210174	Vaishnavi Raman Dwivedi	
41	1608210175	Vansh Gupta	
42	1608210176	Vardaan Shukla	A
43	1608210177	Varun Kumar Tomar	12
44	1608210178	Vedant Saxena	8
45	1608210180	Vikalp Saxena	5
46	1608210181	Vikash Kumar	A
47	1608210182	Vishal	2
48	1608210183	Vishal Bhatnagar	
49	1608210184	Vishal Diwakar	
50	1608210185	Vishal Rawat	
51	1608210186	Vivek Shrestha	A
52	1608210187	Yuvraj Singh Rana	6
53	1508210137	Shubham Saini	
54	1508210156	Tarun Srivastava	
55	1508210084	Mohd. Shuaib	
56	1708210902	Hardik Kumar Singh	A
57	1708210903	Kiran	
58	1708210904	Fiza Khan	8
59	1708210905	Megha Gunjan	10
60	1708210906	Pooja Gola	14

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In Pursuit of Excellence	**List of Weak Students** (Action taken for Improvement)	SESSION-2019-2020 SEM- VII

BASED ON CT-1 MARKS

S.No.	Roll No.	Name	Marks	Section
1	1608210070	Jaideep Choudhary	4	B
2	1608210073	Kshitiz Saxena	1	B
3	1608210090	Mukti	1	B
4	1608210109	Piyush Diwaker	3	B
5	1608210117	Priyam Tyagi	4	B
6	1608210159	Shubham Kumar Chitransh	4	C
7	1608210161	Shubham Sharma	4	C
8	1608210182	Vishal	2	C

* Gave assignments to these students
* Motivated these students in class more by providing opportunities to speak in the class

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In Pursuit of Excellence	**List of Bright Students** (Action taken for Improvement)	SESSION-2019-2020 SEM- VII

BASED ON CT-1 MARKS

S.No.	Roll No.	Name	Marks	Section
1	1608210069	Isha Sethi	13	B
2	1608210071	Juhi Rastogi	12	B
3	1608210079	Mansi Tyagi	13	B
4	1608210080	Milan Vishnoi	12	B
5	1608210107	Paras Dhawan	12	B
6	1608210112	Prakhar Kumar Gautam	14	B
7	1608210113	Prashant Varshney	13	B
8	1608210124	Reetika Gupta	14	B
9	1608210127	Rishabh Chauhan	12	B
10	1608210128	Rishav Chaba	13	B
11	1608210131	Ritvik Rastogi	13	C
12	1608210136	Sakshi Gaur	14	C
13	1608210140	Samra Azeem	13	C
14	1608210141	Sarthak Agarwal	13	C
15	1608210162	Shubhi Jain	14	C
16	1608210165	Soumya Goel	12	C
17	1608210167	Sugandh Sisodia	12	C
18	1608210177	Varun Kumar Tomar	12	C
19	1708210906	Pooja Gola	14	C

* Guiding and encouraging to communicate research papers in conference / journals.

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Moradabad-244001

Moradabad Institute of Technology
Ram Ganga Vihar, Phase-II, Moradabad
4th Year 7th Semester Batch 2016
Computer Science & Engg. **Section A**

RCS 751 Attendance upto ~~6 Sep~~ 17 Oct -2019

Sno	Roll No.	Name of Student	LAB ATT	LAB HELD
1	1608210022	Ankit Kumar	7	8
2	1608210023	Ankit Verma	7	8
3	1608210024	Ankita Saxena	6	8
4	1608210025	Anmol Arora	3	8
5	1608210026	Anmol Vaish	6	8
6	1608210027	Anshika Raj	5	8
7	1608210028	Anshul Yadav	6	8
8	1608210029	Antra Gupta	3	8
9	1608210030	Antriksh Singh	6	8
10	1608210031	Anubhav Baliyan	4	8
11	1608210032	Anukriti Agarwal	6	8
12	1608210033	Anushka Krishnatreya	4	8
13	1608210034	Arjun	7	8
14	1608210035	Arpit Chauhan	7	8
15	1608210036	Arun Kumar Gautam	8	8
16	1608210037	Ashi Verma	6	8
17	1608210038	Ashish	6	8
18	1608210039	Ashish Trivedi	5	8
19	1608210040	Ashmit Narayan Rai	7	8
20	1608210041	Astha Saxena	7	8
21	1608210042	Ayush Gupta	4	8
22	1608210043	Ayush Rastogi	3	10
23	1608210044	Ayushi Gupta	9	10
24	1608210045	Ayushi Mathur	10	10
25	1608210046	Ayushi Saxena	9	10
26	1608210048	Bharat Bajaj	6	10
27	1608210050	Deepansh Saran	5	10
28	1608210051	Dev Karan Singh	9	10
29	1608210052	Devanshu Agarwal	3	10
30	1608210053	Devanshu Varshney	4	10
31	1608210054	Dhruv Bhatt	5	10
32	1608210055	Diti Gupta	6	10
33	1608210056	Divyang Mehrotra	8	10
34	1608210057	Falak Mujeeb	7	10
35	1608210058	Gaurav Yadav	3	10
36	1608210059	Geetanjali Wadhwa	5	10
37	1608210060	Gunjan Radhawal	6	10
38	1608210061	Hannan Tanveer	7	10
39	1608210062	Harsh Choudhary	6	10
40	1608210063	Harsh Verma	4	10
41	1708210901	Abhiv Kumar Yadav	5	10

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Moradabad Institute of Technology
Ram Ganga Vihar, Phase-II, Moradabad
4th Year 7th Semester Batch 2016
Computer Science & Engg. 17 Oct **Section B**

RCS 701 & RCS 751 Attendance upto ~~6 Sep~~ 2019

Sno	Roll No.	Name of Student	TOTAL ATT	TOTAL HELD	LAB ATT	LAB HELD
1	1608210064	Harshita Madhok	20	33	2	9
2	1608210066	Himanshu Agnihotri	15	33	7	9
3	1608210068	Hrithik Sisodia	14	33	8	9
4	1608210069	Isha Sethi	13	33	6	9
5	1608210070	Jaideep Choudhary	11	33	6	9
6	1608210071	Juhi Rastogi	24	33	8	9
7	1608210073	Kshitiz Saxena	16	33	8	9
8	1608210074	Lalit Gupta	11	33	8	9
9	1608210075	Manas Munjial	18	33	9	9
10	1608210076	Manik Agarwal	26	33	7	9
11	1608210077	Manish Singh Bisht	16	33	9	9
12	1608210078	Manisha Singh	23	33	8	9
13	1608210079	Mansi Tyagi	23	33	8	9
14	1608210080	Milan Vishnoi	29	33	9	9
15	1608210081	Mohammad Anas	28	33	9	9
16	1608210082	Mohammad Anzar	15	33	7	9
17	1608210084	Mohd. Aqdus	14	33	7	9
18	1608210086	Mohd. Bilal	13	33	5	9
19	1608210088	Mohd. Tabrez Khan	8	33		
20	1608210089	Mohd Umar	6	33		
21	1608210090	Mukti	8	33		
22	1608210092	Muskan	15	33		
23	1608210093	Muskan Chaddha	17	33		
24	1608210094	Muskan Mathur	21	33		
25	1608210095	Nandni Shishodiya	18	33		
26	1608210096	Neelendra Kumar	13	33		
27	1608210097	Neetesh	19	33		
28	1608210098	Neha Srivastava	15	33		
29	1608210099	Nidhi Patel	11	33		
30	1608210100	Nikhil Kumar S/O PK	24	33		
31	1608210101	Nikhil Kumar S/O RK	18	33		
32	1608210102	Nimisha	14	33		
33	1608210103	Nishant Pal	15	33		
34	1608210104	Nishkarsh Krishan	22	33		
35	1608210105	Nishtha Varshney	17	33		
36	1608210106	Nusrat Ali	13	33		
37	1608210107	Paras Dhawan	26	33		
38	1608210108	Parth Garg	7	33		
39	1608210109	Piyush Diwaker	25	33		
40	1608210110	Piyushi Saraswat	22	33		
41	1608210111	Prakhar Agarwal	17	33		
42	1608210112	Prakhar Kumar Gautam	17	33		
43	1608210113	Prashant Varshney	23	33		
44	1608210114	Pratham Kumar Singh Rathore	19	33		
45	1608210115	Pratiksha Sahani	19	33		
46	1608210116	Prerna Arya	22	33		
47	1608210117	Priyam Tyagi	21	33		
48	1608210118	Puru Raj Singh	15	33		
49	1608210119	Rachit Gahlot	12	33		
50	1608210120	Rajat Diwakar	15	33		
51	1608210122	Rashi Sharma	16	33		
52	1608210123	Ravi Kumar Sagar	4	33		
53	1608210124	Reetika Gupta	17	33		
54	1608210125	Rishabh Agarwal	21	33		
55	1608210126	Rishabh Chandok	16	33		
56	1608210127	Rishabh Chauhan	21	33		
57	1608210128	Rishav Chaba	17	33		
58	1608210129	Ritik Gupta	22	33		

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Moradabad Institute of Technology
Ram Ganga Vihar, Phase-II, Moradabad
4th Year 7th Semester Batch 2016
Computer Science & Engg. 17 Oct Section C
RCS 701 & RCS 751 Attendance upto ~~6-Sep~~-2019

Sno	Roll No.	Name of Student	TOTAL ATT	TOTAL HELD	LAB ATT	LAB HELD
1	1608210130	Ritish Varshney	14	35	6	10
2	1608210131	Ritvik Rastogi	26	35	7	10
3	1608210133	S.M.Shanawar	14	35	5	10
4	1608210134	Sachin Singh	20	35	7	10
5	1608210135	Sakshi Agarwal	16	35	7	10
6	1608210136	Sakshi Gaur	22	35	6	10
7	1608210137	Sakshi Saxena	21	35	5	10
8	1608210138	Samarth Goel	22	35	7	10
9	1608210139	Sameeksha Vishnoi	20	35	7	10
10	1608210140	Samra Azeem	26	35	7	10
11	1608210141	Sarthak Agarwal	24	35	4	10
12	1608210142	Satyam Agarwal	16	35	4	10
13	1608210143	Saumya Agarwal	22	35	7	10
14	1608210145	Shafaque Naz	18	35	6	10
15	1608210147	Shashank Yadav	12	35	6	10
16	1608210148	Shipra Dhingra	17	35	6	10
17	1608210149	Shivam Srivastva	22	35	6	10
18	1608210150	Shivam Anand	20	35	6	10
19	1608210151	Shivansh Narayan	21	35	7	10
20	1608210152	Shreya Mishra	27	35	7	10
21	1608210153	Shubham	22	35	7	10
22	1608210154	Shubham Bhatt	18	34		
23	1608210155	Shubham Chauhan	20	34		
24	1608210156	Shubham Gupta S/O A.K.G	24	34		
25	1608210157	Shubham Gupta S/O S.K.G	17	34		
26	1608210158	Shubham Kumar	12	34		
27	1608210159	Shubham Kumar Chitransh	16	34		
28	1608210160	Subham Kumar Singh	10	34		
29	1608210161	Shubham Sharma	24	34		
30	1608210162	Shubhi Jain	18	34		
31	1608210163	Sonali Saxena	15	34		
32	1608210164	Km Sonam Sehrawat	18	34		
33	1608210165	Soumya Goel	21	34		
34	1608210167	Sugandh Sisodia	20	34		
35	1608210169	Twinkle Rastogi	23	34		
36	1608210170	Udita Bansal	22	34		
37	1608210171	Utkarsh Saxena	12	34		
38	1608210172	Utkarsh Mishra	16	34		
39	1608210173	Vaibhav Kumar	12	34		
40	1608210174	Vaishnavi Raman Dwivedi	10	34		
41	1608210175	Vansh Gupta	15	34		
42	1608210176	Vardaan Shukla	18	34		
43	1608210177	Varun Kumar Tomar	26	35		
44	1608210178	Vedant Saxena	31	35		
45	1608210180	Vikalp Saxena	23	35		
46	1608210181	Vikash Kumar	22	35		
47	1608210182	Vishal	24	35		
48	1608210183	Vishal Bhatnagar	13	35		
49	1608210184	Vishal Diwakar	17	35		
50	1608210185	Vishal Rawat	12	35		
51	1608210186	Vivek Shrestha	28	35		
52	1608210187	Yuvraj Singh Rana	17	35		
53	1508210137	Shubham Saini	6	35		
54	1508210156	Tarun Srivastava	6	35		
55	1508210084	Mohd. Shuaib	12	35		
56	1708210902	Hardik Kumar Singh	12	35		
57	1708210903	Kiran	12	35		
58	1708210904	Fiza Khan	20	35		
59	1708210905	Megha Gunjan	22	35		
60	1708210906	Pooja Gola	26	35		

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In Pursuit of Excellence	List of Students having short attendance before CT2	SESSION-2019-2020 SEM- VII

Distributed Systems RCS-701 **Section B, C**

S NO	ROLL NO	NAME	SECTION	PERCENTAGE
1.	1608210068	Hrithik Sisodia	B	42
2.	1608210069	Isha Sethi	B	39
3.	1608210070	Jaideep Choudhary	B	33
4.	1608210074	Lalit Gupta	B	33
5.	1608210084	Mohd. Aqdus	B	42
6.	1608210086	Mohd. Bilal	B	39
7.	1608210088	Mohd. Tabrez Khan	B	24
8.	1608210089	Mohd Umar	B	18
9.	1608210090	Mukti	B	24
10.	1608210096	Neelendra Kumar	B	39
11.	1608210099	Nidhi Patel	B	33
12.	1608210102	Nimisha	B	42
13.	1608210106	Nusrat Ali	B	39
14.	1608210108	Parth Garg	B	21
15.	1608210119	Rachit Gahlot	B	36
16.	1608210123	Ravi Kumar Sagar	B	12
17.	1608210130	Ritish Varshney	C	40
18.	1608210133	S.M.Shanawar	C	40
19.	1608210147	Shashank Yadav	C	34
20.	1608210158	Shubham Kumar	C	35
21.	1608210160	Subham Kumar Singh	C	29
22.	1608210163	Sonali Saxena	C	44
23.	1608210171	Utkarsh Saxena	C	35
24.	1608210173	Vaibhav Kumar	C	35
25.	1608210174	Vaishnavi Raman Dwivedi	C	29
26.	1608210175	Vansh Gupta	C	44
27.	1608210183	Vishal Bhatnagar	C	37
28.	1608210185	Vishal Rawat	C	34
29.	1508210137	Shubham Saini	C	17
30.	1508210156	Tarun Srivastava	C	17
31.	1508210084	Mohd. Shuaib	C	34
32.	1708210902	Hardik Kumar Singh	C	34
33.	1708210903	Kiran	C	34

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CLASS TEST 2

SET I

Course: B.Tech.
Session: 2019- 20
Subject: DISTRIBUTED SYSTEM
Max. Marks: 20

Semester: 7th
Section: A,B,C
Subject Code: RCS-701
Time: 1:15 Hrs

Q.No. :	1	2	3	4	5	6
CO No. :	2	3	3	3	2	3

Section A (4 Marks)

Q1. What is Phantom Deadlock? 2 Mark

Q2. What do you mean by Agreement Protocol? 2 Mark

Section B (6 Marks)

Q3. Discuss in brief the different algorithms used for implementing Distributed Shared Memory. 3 Mark

Q4. : Show that Byzantine agreement cannot always be reached among four processors if two processors are faulty. 3 Mark

Section C (10 Marks)

Q5. Discuss Ho-Ramamoorthy's two phase algorithm for deadlock detection. 5 Mark

Q6. Draw the Architecture of Distributed File system. Discuss the design Issues in Distributed File System. 5 Mark

ALL THE BES

21/10/19
Prachi Gupta
Subject Teacher
Assistant Prof. CSE

21-10-19
Anurag Malik
Subject Coordinator
Associate Prof. CSE

Dr. Somesh Kumar
Prof. & Head, CSE
Moradabad Institute of Technology
Moradabad-244001

CLASS TEST 2

SET II

Course: B.Tech.
Session: 2019- 20
Subject: DISTRIBUTED SYSTEM
Max. Marks: 20

Semester: 7th
Section: A,B,C
Subject Code: RCS-701
Time: 1:15 Hrs

Q.No. :	1	2	3	4	5	6
CO No. :	2	3	3	3	3	2

Section A (4 Marks)

Q1. Describe Distributed Deadlock. 2 Mark

Q2. Explain mounting in distributed system. 2 Mark

Section B (6 Marks)

Q3. Explain the concept of shared memory with its architecture. 3 Mark

Q4. Give a brief description of Byzantine agreement problem. State the agreement and validity objectives of Byzantine agreement problem. 3 Mark

Section C (10 Marks)

Q5. Explain various issues that must be addressed in design and implementation of distributed file system. 5 Mark

Q6. Classify the Deadlock detection algorithms. Describe the Edge- Chasing deadlock detection algorithm. 5 Mark

ALL THE BEST

21/10/19

Prachi Gupta

Subject Teacher

Assistant Prof. CSE

21-10-19

Anurag Malik

Subject Coordinator

Associate Prof. CSE

Dr. Somesh Kumar
Prof. & Head, CSE
Moradabad Institute of Technology
Moradabad-244001

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MORADABAD INSTITUTE OF TECHNOLOGY, MORADABAD
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
CLASS TEST 2 SOLUTION (7th semester)
SET-II

Course: B.Tech. **Semester: 7th**
Session: 2019-2020 **Section: A,B,C**
Subject Name: Distributed System **Subject Code: RCS-701**

Q.1. Describe Distributed Deadlock.

A.1. Distributed Deadlock

- Permanent blocking of a set of processes that either compete for system resources or communicate with each other
- No node has completed and up-to-date knowledge of the entire distributed system
- Message transfers between processes take unpredictable delays

In DS, a process can request & release resources (local or remote) in any order, which may not be known a priori & a process can request resources while holding others. If the sequence of allocation of resources to processes is not controlled in such environments, deadlock can occur. A deadlock is a Blocked Process which can never be resolved unless there is some outside Intervention.

Q.2. Explain mounting in distributed system.

A.2. Mounting-

- A mount mechanism allows the binding together of different filename spaces to form a single hierarchically structured name space. Most of the existing distributed file system are based on UNIX.
- A name space (or a collection of files) can be mounted at an internal or leaf node of a name space tree.
- A node onto which a name space is mounted is known as a mount point.
- In figure ahead, nodes a and c are mount point at which directories stored at server Y and Z are mounted respectively.
- The kernel maintains a structure called the mount table which maps mount points to appropriate storage devices.
- In distributed file system, file system maintained by remote servers are mounted at the clients.

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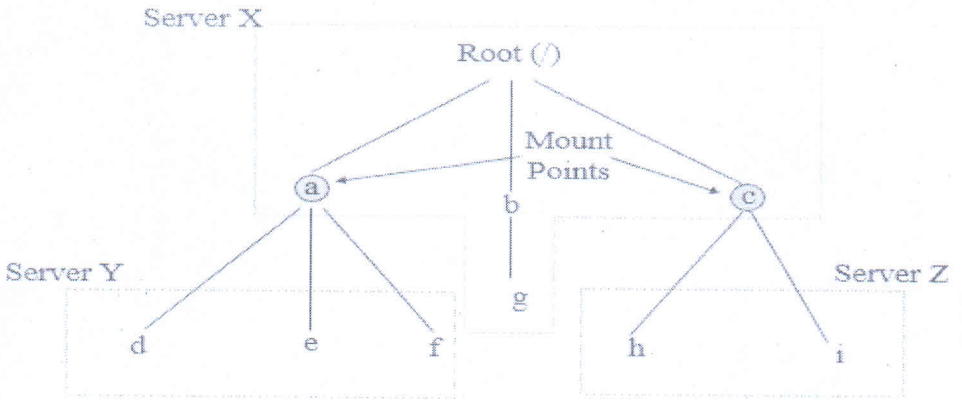
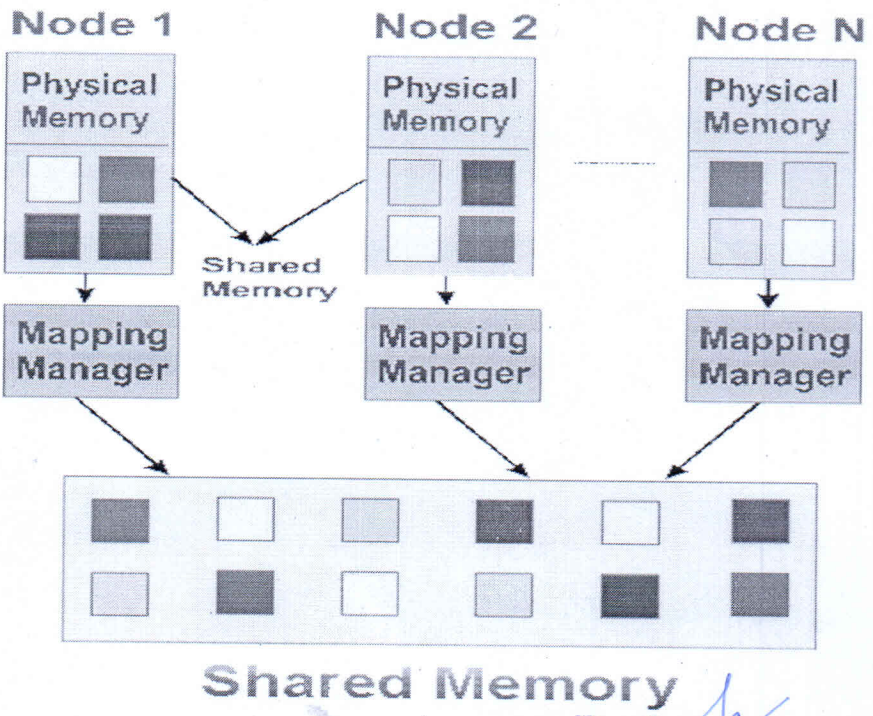
- Each client has to individually mount every required file system. This is employed in SUN NFS. So every client need not see an identical file name space.
- Mount information can be maintained at servers, in which every client sees an identical file name space (Sprite File System). If files are moved to a different server, then mount information need only be updated at the servers.



Q.3. Explain the concept of shared memory with its architecture.

A.3. DSM is an abstraction used for sharing data between computers that do not share physical memory.

- It is a resource management component of a distributed operating system.
- The distributed shared memory (DSM) implements the shared memory model in distributed systems, which have no physical shared memory. (Fig ahead)
- The shared memory model provides a virtual address space shared between all nodes
-It overcome the high cost of communication in distributed systems, DSM systems move data to the location of access.



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Q.4. Give a brief review of Byzantine agreement problem. State the agreement and validity objectives of Byzantine agreement problem.

A.4. In Byzantine agreement problem, an arbitrarily chosen processor, called the source processor, broadcasts its initial value to all other processors. A solution to the Byzantine agreement problem should meet the following two objectives:

Agreement: All non-faulty processors agree on the same value.

Validity: If the source processor is non-faulty then the common agreed upon value by all non-faulty processors should be the initial value of the source.

Two points should be noted:

If the source processor is faulty, then all non-faulty processors can agree on any common value.

It is irrelevant what value faulty processors agree on or whether they agree on a value at all.

Q.5. Explain various issues that must be addressed in design and implementation of distributed file system.

A.5. The major Design Issues in Distributed File System are as follows:

1. **Name and Name Resolution-** A name in file systems is associated with an object (such as a file or a directory). Name resolution refers to the process of mapping a name to an object or in case of replication to multiple objects. There are **two approaches to name files in a distributed environment**. The simplest scheme is to **concatenate the host name to the name of files** that are stored on that host. The problem with this approach is that moving a file from one host to another requires changes in the filename and in the applications accessing that file i.e it is location dependent.

   The second approach is to **mount remote directories onto local directories**. Once a remote directory is mounted, its file can be referenced in a location transparent manner.

   Naming is the mapping between logical and physical objects.

   Example: A user filename maps to <cylinder, sector>.
2. **Caches on Disk or Main Memory-** The issue is whether the data cached by a client should be in the main memory or on a local disk at the client.

   Advantage of cache in main memory

   Diskless workstations can also take advantage of caching.

   Accessing a cache in main memory is much faster than accessing a cache on local disk.

   The server – cache is in the main memory at the server and hence a single design for caching mechanism is applicable to both clients and servers.

   Advantage of caching on local disk

   Large files can be cached without affecting a workstation's performance.

   The virtual memory management is simple.
3. **Writing Policy-** The writing policy decides when a modified cache block at a client should be transferred to the server.

   Write through - All writes requested by the applications at clients are also carried out at the servers immediately. Advantage is reliability. In the event of a client crash, little information is lost. But it does not take advantage of the cache.

Delayed writing Policy - Delays the writing at the server. It takes advantage of the cache by performing many writes on a block present locally in the cache. Another motivation is that some of the data could be deleted in a short time in which case data need not be written at the server at all.

Write On close Policy - Delays the updating of the files at the server until the file is closed at the client.

4. **Availability-** It is one of the important issues as the failure of servers or n/w can severely affect availability of files. Replication is used for enhancing the availability of files. Under replication many copies of files (replicas) are maintained at different servers. Replication is expensive because of the extra storage space required to store the replicas. Two problems with replication are
   How to keep the replicas of a file consistent?
   How to detect inconsistencies among replicas of a file?
5. **Scalability-** Deals with the suitability of the design of a system to cater to the demands of a growing system. Currently, client- server organization is a commonly used approach.
   Issue: can the design support a growing system?
   Example: server-initiated cache invalidation complexity and load grow with size of system.
   Possible solutions:
   Do not provide cache invalidation service for read-only files
   Provide design to allow users to share cached data
   Design file servers for scalability: threads, SMPs, clusters
6. **Semantics-**

What is the effect / meaning of an operation?
Expected semantics: a read will return data stored by the latest write
Possible options:
All read and writes go through the server
Disadvantage: communication overhead
Use of lock mechanism
Disadvantage: file not always available

Q.6. Classify the Deadlock detection algorithms. Describe the Edge- Chasing deadlock detection algorithm.

A.6. Deadlock detection algorithms

- All sites collectively cooperate to detect a cycle in the state graph that is likely to be distributed over several sites of the system.
- A DDDA can be initiated whether a process is forced to wait, and it can be initiated either by the local site of the process or by the site where the process waits.
- DDDA can be divided into four classes
- Path-pushing: resource dependency information disseminated through designated paths (a sequence of wait–for dependency edges).eg Menasce –Muntz and Obermarck.
- Edge-chasing: special messages or probes circulated along edges of WFG. Deadlock exists if the probe is received back by the initiator. Eg. Chandy-Misra-Haas's Algorithm.

- Diffusion computation: queries on status sent to process in WFG.
- Global state detection: get a snapshot of the distributed system.

The algorithm

To determine if a blocked process is deadlocked, the System executes the following algorithm.

if P_i is locally dependent on itself
then declare a deadlock
else
for all P_j and P_k such that

a) P_i is locally dependent upon P_j and

b) P_j is waiting on P_k and

c) P_j and P_k are on different sites send probe (i, j, k) to the home site of P_k

On the receipt of probe **(i, j, k)** the site takes the following actions.

If

d) P_k is blocked and

e) $Dependent_k(i)$ is **false** and

f) P_k has not replied to all requests of P_j

Then
Begin
$Dependent_k(i) = true$,
If k = i
then declare that P_i is deadlocked
else for all P_m and P_n such that

a') P_k is locally dependent upon P_m, and

b') P_m is waiting on P_n and

c') P_m and P_n are on different sites,

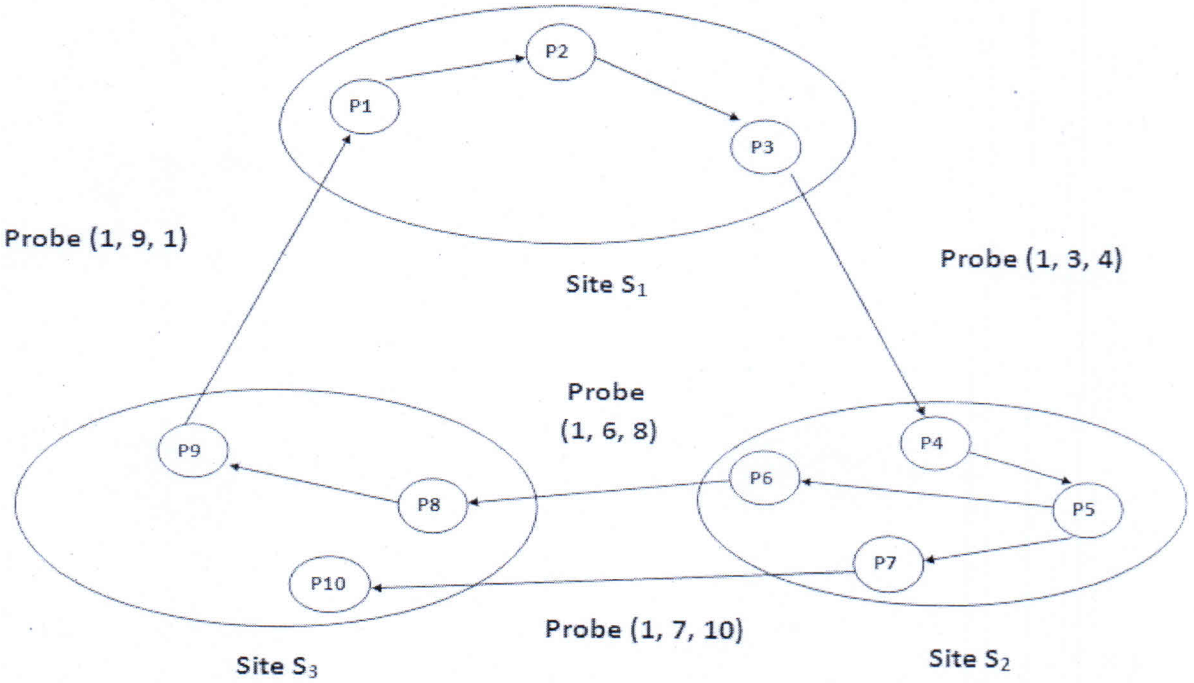
send probe (i, m, n) to the home site of P_n

end.

Sends one probe msg on each edge of **WFG**. So almost **m(n-1)/2** mgs required for **m** process & **n** sites, **Delay** in detecting the deadlock= **O(n).**

As an example, consider the system shown in fig below. If process P_1 initiates deadlock detection, it sends probe(1,3,4) to S_2 . Since P_6 is waiting for P_8 and is P_7 waiting for P_{10}, S_2 sends probes (1,6,8) and (1,7,10) to S_3 which in turn sends probe (1,9,1) to S_1. On receiving probe(1,9,1), S_1 declares that P_1 is deadlocked.

An Example of Chandy et al.'s Edge-Chasing Algorithm



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Moradabad-244001

Subject Teacher: Ms. Prachi Gupta

MIT Group of Institutions, Moradabad

ATTENDANCE SHEET

Session: 2019-20

Class Test I / II / III

Date: 23.10.19 Shift: I st

Year: 4th Semester: 7th

Room No: D-303

Section/Branch: B | CSE

Subject Name: Distributed System

Subject Code: RCS-701

S. No	Roll No.	Name of Student	20	Branch	Signature
1.	1608210064	Harshita Madhok	9.5	CS	Harshita
2.	1608210066	Himanshu Agnihotri	10	CS	Himanshu
3.	1608210068	Hrithik Sisodia	12	CS	Hrithik Sisodia
4.	1608210071	Juli Rastogi	16.5	CS	Juli
5.	1608210073	Kshitiz Saxena	9.5	CS	Kshitiz
6.	1608210079	Mansi Tyagi	17.5	CS	mansi tyagi
7.	1608210076	Manik Agarwal	14	CS	Manik
8.	1608210075	Monoj Munjial	12.5	CS	Monoj
9.	1608210074	Lalit Gupta	9.5	CS	Lalit Gupta
10.	1608210080	Milan Vishnoi	18	CS	Milan Vishnoi
11.	1608210081	Mohammad Anas	16.5	CS	Anas
12.	1608210082	Mohammad Anzar	10.5	CS	Anzar
13.	1608210084	Mohd Aqdus	12.5	CS	Mohd Aqdus
14.	1608210086	Mohd Bilal	8.5	CS	Mohd Bilal
15.	1608210088	Mohd. Tabrez Khan	11.5	CS	Tabrez Khan
16.	1608210097	Neetesh	8.5	CS	
17.	1608210095	Nandni	13	CS	Nandni
18.	1608210094	Muskan Mathur	13	CS	Muskan
19.	1608210093	Muskan Chaddha	15	CS	
20.	1608210092	Muskan	9	CS	Muskan
21.	1608210077	Manish Bisht	10.5	CS	
22	1608210069	} ABSENT			
23.	70				
24.	78				
25.	98				
26.					
27.					
28.					
29					
30.					

Dr. Somesh Kumar
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Moradabad Institute of Technology
Moradabad-244001

Total No. of Students allotted in Room: 25 Students Absent: 04 Students Present: 21

Invigilators: 1) Name: Nasta Agarwal Sign:

2) Name: Prachi Agarwal Sign:

Subject Teacher: Ms: Prachi Gupta

MIT Group of Institutions, Moradabad

ATTENDANCE SHEET

Session: 2019-20

Class Test I / II / III

Date: 23.10.19 Shift: I Room No: D-306

Year: 4th Semester: 7th Section/Branch: B/CS

Subject Name: Distributed System Subject Code: RCS-701

S. No	Roll No.	Name of Student		Branch	Signature
1.	1608210101	Nikhil Kumar IInd	3	CS	Nikhil
2.	1608210102	Nimisha	11.5	CS	Nimisha
3.	1608210104	Nishkarsh Krishan	8	CS	
4.	1608210106	Nusrat Ali	4.5	CS	Nusrat
5.	1608210110	Piyushi Saraswat	14	CS	Piyushi
6.	1608210111	Prakhar Agarwal	12.5	C.S.	Prakhar
7.	1608210112	Prakhar Kumar Gautam	6.5	C.S.	Prakhar
8.	1608210113	Prashant Varshney	7	CS.	Prashant
9.	1608210114	Pratham Rathore	15.5	CS	
10.	1608210116	Prerna Arya	15.5	CSE	Prerna.
11.	1608210117	Priyam Tyagi	6	CSE	Priyam
12.	1608210118	Puru Raj Singh	6.5	C.S	Puru Raj
13.	1608210119	Rachit Gahlot	9.5	CS	Rachit.
14.	1608210120	Rajat Diwakar	5.5	CSE	Rajat
15.	1608210125	Rishabh Agarwal	10	CSE	Agarwal
16.	1608210126	Rishabh Chandak.	14	CSE	Chandak
17.	1608210127	Rishabh Chauhan	16.5	CSE	Rishabh
18.	1608210129	Ritik Gupta	17.5	CSE	Ritik
19.	1608210100				
20.	103				
21.	105				
22.	107	ABSENT			
23.	109				
24.	115				
25.	122				
26.	124				
27.	128				
28.					
29.					
30.					

02 Debarred (1082123)

Dr. Somesh Kumar
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Moradabad Institute of Technology
Moradabad-244001

Total No. of Students allotted in Room: 27 Students Absent: 09 Students Present: 18

Invigilators: 1) Name Khilendra Singh Sign

2) Name Sachi Ke Ag Sign

Subject Teacher: Ms. Prachi Gupta

MIT Group of Institutions, Moradabad

ATTENDANCE SHEET

Session: 2019-20

Class Test I / II / III

Date: 23.10.2019 Shift: Ist Room No: B-309

Year: 4th year Semester: VIIth Section/Branch: C/CSE

Subject Name: Distributed System Subject Code: RCS-701

S. No	Roll No.	Name of Student	Branch	Signature
1.	1608210130	Ritish Varshney	CSE	Ritish
2.	1608210131	Rituik Rastogi	CSE	Rituik
3.	1608210133	S.M. Shanawar	CSE	[signature]
4.	1608210134	Sachin Singh	CSE	[signature]
5.	1608210135	Sakshi Agarwal	CSE	[signature]
6.	1608210136	Sakshi Gaur	CSE	Sakshi
7.	1608210137	sakshi saxena	CSE	Sakshi
8.	1608210138	Samarth Goel	CSE	[signature]
9.	1608210141	Sarthak Agarwal	CSE	[signature]
10.	1608210142	Satyam Agarwal	CSE	Sam.
11.	1608210143	Saumya Agarwal	CSE	Saumya
12.	1608210145	Shafaque Naz	CSE	Shafaque
13.	1608210147	Shashank yadav	C.S.E	[signature]
14.	1608210148	Shipra Dhingra	CE	Shipra
15.	1608210149	Shivam Srivastava	CSE	Shivam
16.	1608210150	shivam Anand	CSE	Shivam
17.	1608210151	Shivansh Narayan	CSE	Shivansh
18.	1608210153	Shubham	CSE	Shubham
19.	1608210162	Shubhi Jain	CSE	Shubhi Jain
20.	1608210159	Shubham Kumar Chitransh	"	Shubham
21.	1608210156	SHUBHAM GUPTA	CSE	[signature]
22.	1608210154	Shubham Bhatt	CSE	S.Bhatt
23.	1608210139	ABSENT		
24.	1608210140	ABSENT		
25.	1608210152	ABSENT		
26.	1608210155	ABSENT		
27.	1608210157	ABSENT		
28.	1608210158	ABSENT		
29.	1608210161	ABSENT		
30.				

Dr. Somesh Kumar
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Total No. of Students allotted in Room: 29 Students Absent: 07 Students Present: 22

Invigilators: 1) Name Dr. Amit Saxena Sign: [signature]

2) Name Ramesh Dubey Sign: [signature] 23/10/19

Subject Teacher: Ms. Prachi Gupta

MIT Group of Institutions, Moradabad

ATTENDANCE SHEET

Session: 2019-20

Class Test I / II / III

Date: 23/10/19 Shift: 1st Room No: B-311

Year: 4th Semester: 7th Section/Branch: C/CS

Subject Name: Distributed System Subject Code: RCS-701

S. No	Roll No.	Name of Student	Branch	Signature
1.	1608210163	Sonali Saxena	CSE	Sonali
2.	1608210164	Sonam Sehrawat	CSE	Sonam
3.	1608210165	Soumya Goel	CSE	Soumya
4.	1608210169	Twinkle Rastogi	CSE	Twinkle
5.	1608210170	Udita Bansal	CSE	Udita
6.	1608210178	Vedant Saxena	CSE	Saxena
7.	1608210176	Vaidgan Shukla	CSE	
8.	1608210173	Vaibhav Kumar	CSE	
9.	1608210181	Vikash Kumar	CSE	Vikash
10.	1608210182	Vishal	"	Vishal
11.	1608210183	Vishal Bhatnagar	CSE	Vishal
12.	1608210186	Vivek Shrestha	CSE	
13.	1708210906	Pooja Gola	"	Pooja
14.	1708210904	Fiza Khan	CSE	Fiza Khan
15.	1708210903	Kiran	CSE	Kiran
16.	1708210902	Hardik	CSE	Hardik
17.	1508210084	Mohd Shuaib	CSE	
18.	1608210167			
19.	" 172			
20.	" 175			
21.	" 177			
22.	" 180			
23.	" 185			
24	" 187			
25.	1708210905			
26.	1608210 171			
27.	" 184			
28.				
29.				
30.				

Absent

1508210137
1508210156
1608210174

Debarred

Dr. Somesh Kumar
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Total No. of Students allotted in Room: 27 Students Absent: 10 Students Present: 17

Invigilators: 1) Name Puneet Kumar Sign: 23/10

2) Name Shweta Agarwal Sign: 23/10/19

In Pursuit of Excellence	Class Test 2 Marks	SESSION-2019-2020	SEM- 7th
Sno.	Roll No.	Name of Students	TOTAL(20)
1	1608210064	Harshita Madhok	9.5
2	1608210066	Himanshu Agnihotri	10
3	1608210068	Hrithik Sisodia	12
4	1608210069	Isha Sethi	A
5	1608210070	Jaideep Choudhary	A
6	1608210071	Juhi Rastogi	16.5
7	1608210073	Kshitiz Saxena	12
8	1608210074	Lalit Gupta	9.5
9	1608210075	Manas Munjial	12.5
10	1608210076	Manik Agarwal	14
11	1608210077	Manish Singh Bisht	10.5
12	1608210078	Manisha Singh	A
13	1608210079	Mansi Tyagi	17.5
14	1608210080	Milan Vishnoi	18
15	1608210081	Mohammad Anas	16.5
16	1608210082	Mohammad Anzar	15
17	1608210084	Mohd. Aqdus	12.5
18	1608210086	Mohd. Bilal	8.5
19	1608210088	Mohd. Tabrez Khan	15
20	1608210089	Mohd Umar	17
21	1608210090	Mukti	17
22	1608210092	Muskan	13
23	1608210093	Muskan Chaddha	15
24	1608210094	Muskan Mathur	13
25	1608210095	Nandni Shishodiya	13
26	1608210096	Neelendra Kumar	D
27	1608210097	Neetesh	13
28	1608210098	Neha Srivastava	17
29	1608210099	Nidhi Patel	D
30	1608210100	Nikhil Kumar S/O PK	A
31	1608210101	Nikhil Kumar S/O RK	3
32	1608210102	Nimisha	11.5
33	1608210103	Nishant Pal	A
34	1608210104	Nishkarsh Krishan	8
35	1608210105	Nishtha Varshney	A
36	1608210106	Nusrat Ali	4.5
37	1608210107	Paras Dhawan	A
38	1608210108	Parth Garg	D
39	1608210109	Piyush Diwaker	A
40	1608210110	Piyushi Saraswat	14
41	1608210111	Prakhar Agarwal	12.5
42	1608210112	Prakhar Kumar Gautam	6.5
43	1608210113	Prashant Varshney	7
44	1608210114	Pratham Kumar Singh Rathore	15.5
45	1608210115	Pratiksha Sahani	A
46	1608210116	Prerna Arya	15.5
47	1608210117	Priyam Tyagi	7
48	1608210118	Puru Raj Singh	6.5
49	1608210119	Rachit Gahlot	9.5
50	1608210120	Rajat Diwakar	5.5
51	1608210122	Rashi Sharma	A
52	1608210123	Ravi Kumar Sagar	D
53	1608210124	Reetika Gupta	A
54	1608210125	Rishabh Agarwal	10
55	1608210126	Rishabh Chandok	14
56	1608210127	Rishabh Chauhan	16.5
57	1608210128	Rishav Chaba	A
58	1608210129	Ritik Gupta	17.5

Dr. Somesh Kumar
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In Pursuit of Excellence	Class Test 2 Marks	SESSION-2019-2020	SEM- 7th
Sno.	Roll No.	Name of Students	TOTAL(20)
1	1608210130	Ritish Varshney	14
2	1608210131	Ritvik Rastogi	18
3	1608210133	S.M.Shanawar	20
4	1608210134	Sachin Singh	13
5	1608210135	Sakshi Agarwal	17
6	1608210136	Sakshi Gaur	16
7	1608210137	Sakshi Saxena	15
8	1608210138	Samarth Goel	13
9	1608210139	Sameeksha Vishnoi	A
10	1608210140	Samra Azeem	A
11	1608210141	Sarthak Agarwal	17
12	1608210142	Satyam Agarwal	15
13	1608210143	Saumya Agarwal	15
14	1608210145	Shafaque Naz	16
15	1608210147	Shashank Yadav	13
16	1608210148	Shipra Dhingra	16
17	1608210149	Shivam Srivastva	14
18	1608210150	Shivam Anand	15
19	1608210151	Shivansh Narayan	15
20	1608210152	Shreya Mishra	A
21	1608210153	Shubham	15
22	1608210154	Shubham Bhatt	12
23	1608210155	Shubham Chauhan	A
24	1608210156	Shubham Gupta S/O A.K.G	16
25	1608210157	Shubham Gupta S/O S.K.G	0
26	1608210158	Shubham Kumar	13
27	1608210159	Shubham Kumar Chitransh	5
28	1608210160	Subham Kumar Singh	D
29	1608210161	Shubham Sharma	A
30	1608210162	Shubhi Jain	15
31	1608210163	Sonali Saxena	18
32	1608210164	Km Sonam Sehrawat	12
33	1608210165	Soumya Goel	15
34	1608210167	Sugandh Sisodia	A
35	1608210169	Twinkle Rastogi	14
36	1608210170	Udita Bansal	17
37	1608210171	Utkarsh Saxena	16
38	1608210172	Utkarsh Mishra	A
39	1608210173	Vaibhav Kumar	12
40	1608210174	Vaishnavi Raman Dwivedi	18
41	1608210175	Vansh Gupta	11
42	1608210176	Vardaan Shukla	17
43	1608210177	Varun Kumar Tomar	A
44	1608210178	Vedant Saxena	16
45	1608210180	Vikalp Saxena	A
46	1608210181	Vikash Kumar	12
47	1608210182	Vishal	12
48	1608210183	Vishal Bhatnagar	11
49	1608210184	Vishal Diwakar	16
50	1608210185	Vishal Rawat	14
51	1608210186	Vivek Shrestha	11
52	1608210187	Yuvraj Singh Rana	A
53	1508210137	Shubham Saini	D
54	1508210156	Tarun Srivastava	D
55	1508210084	Mohd. Shuaib	8
56	1708210902	Hardik Kumar Singh	13
57	1708210903	Kiran	12
58	1708210904	Fiza Khan	14
59	1708210905	Megha Gunjan	A
60	1708210906	Pooja Gola	17

07

Dr. Somesh Kumar
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Moradabad-244001

In Pursuit of Excellence	**List of Weak Students** (Action taken for Improvement)	SESSION-2019-2020 SEM-VII

BASED ON CT-2 MARKS

S.No.	Roll No.	Name	Marks	Section
1	1608210096	Neelendra Kumar	Debarred	B
2	1608210099	Nidhi Patel	Debarred	B
3	1608210101	Nikhil Kumar S/O RK	3	B
4	1608210106	Nusrat Ali	4.5	B
5	1608210108	Parth Garg	Debarred	B
6	1608210123	Ravi Kumar Sagar	Debarred	C
7	1608210157	Shubham Gupta S/O S.K.G	0	C
8	1608210159	Shubham Kumar Chitransh	5	C
9	1608210160	Subham Kumar Singh	Debarred	C
10	1508210137	Shubham Saini	Debarred	C
11	1508210156	Tarun Srivastava	Debarred	C

* Individual academic counseling was done.

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Moradabad-244001

In Pursuit of Excellence	**List of Bright Students** (Action taken for Improvement)	SESSION-2019-2020 SEM- VII

BASED ON CT-2 MARKS

S.No.	Roll No.	Name	Marks	Section
1	1608210071	Juhi Rastogi	16.5	B
2	1608210079	Mansi Tyagi	17.5	B
3	1608210080	Milan Vishnoi	18	B
4	1608210081	Mohammad Anas	16.5	B
5	1608210089	Mohd Umar	17	B
6	1608210090	Mukti	17	B
7	1608210098	Neha Srivastava	17	B
8	1608210127	Rishabh Chauhan	16.5	B
9	1608210129	Ritik Gupta	17.5	B
10	1608210131	Ritvik Rastogi	18	C
11	1608210133	S.M.Shanawar	20	C
12	1608210135	Sakshi Agarwal	17	C
13	1608210136	Sakshi Gaur	16	C
14	1608210141	Sarthak Agarwal	17	C
15	1608210145	Shafaque Naz	16	C
16	1608210148	Shipra Dhingra	16	C
17	1608210156	Shubham Gupta S/O A.K.G	16	C
18	1608210163	Sonali Saxena	18	C
19	1608210170	Udita Bansal	17	C
20	1608210171	Utkarsh Saxena	16	C
21	1608210174	Vaishnavi Raman Dwivedi	18	C
22	1608210176	Vardaan Shukla	17	C
23	1608210178	Vedant Saxena	16	C

* Provided question bank with necessary questions for bright students.

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Moradabad-244001

In Pursuit of Excellence	**Record of Monthly Attendance**	SESSION-2019-2020 SEM- 7th

Attendance Register. Dates From: 03-08-2019 to 22-11-2019

Paper Code - RCS-701

• Session: 2019-2020 • Course: B.Tech • Year: 4th • Section: B

S. No.	Roll Number	Name	(P)	(A)	Tot.	Tot. (%age)
1	1608210064	Harshita Madhok	35	15	50	70
2	1608210066	Himanshu Agnihotri	31	19	50	62
3	1608210068	Hrithik Sisodia	30	20	50	60
4	1608210069	Isha Sethi	29	21	50	58
5	1608210070	Jaideep Choudhary	27	23	50	54
6	1608210071	Juhi Rastogi	39	11	50	78
7	1608210073	Kshitiz Saxena	33	17	50	66
8	1608210074	Lalit Gupat	27	23	50	54
9	1608210075	Manas Munjial	35	15	50	70
10	1608210076	Manik Agarwal	42	8	50	84
11	1608210077	Manish Singh Bisht	32	18	50	64
12	1608210078	Manisha Singh	39	11	50	78
13	1608210079	Mansi Tyagi	40	10	50	80
14	1608210080	Milan Vishnoi	46	4	50	92
15	1608210081	Mohd Anas	44	6	50	88
16	1608210082	Mohammad Anzar	27	23	50	54
17	1608210084	Mohd Aqdus	29	21	50	58
18	1608210086	Mohd Bilal	30	20	50	60
19	1608210088	Mohd Tabrez Khan	24	26	50	48
20	1608210089	Mohd Umar	24	26	50	48
21	1608210090	Mukti	26	23	49	53.06
22	1608210092	Muskan	30	19	49	61.22
23	1608210093	Muskan Chadda	32	17	49	65.31
24	1608210094	Muskan Mathur	33	16	49	67.35
25	1608210095	Nandni Shishodiya	32	17	49	65.31
26	1608210096	Neelendra Kumar	26	23	49	53.06
27	1608210097	Neetesh	34	15	49	69.39
28	1608210098	Neha Srivastava	31	18	49	63.27
29	1608210099	Nidhi Patel	26	23	49	53.06
30	1608210100	Nikhil Kumar	36	13	49	73.47
31	1608210101	Nikhil Kumar	33	16	49	67.35

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32	1608210102	Nimisha	29	20	49	59.18
33	1608210103	Nishant Pal	31	18	49	63.27
34	1608210104	Nishkarsh Krishan	36	13	49	73.47
35	1608210105	Nishtha Varshney	34	15	49	69.39
36	1608210106	Nusrat Ali	26	23	49	53.06
37	1608210107	Paras Dhawan	40	9	49	81.63
38	1608210108	Parth Garg	24	25	49	48.98
39	1608210109	Piyush Diwakar	39	10	49	79.59
40	1608210110	Piyushi Saraswat	38	11	49	77.55
41	1608210111	Prakhar Agarwal	31	18	49	63.27
42	1608210112	Prakhar Kumar Gautam	30	19	49	61.22
43	1608210113	Prashant Varshney	37	12	49	75.51
44	1608210114	Pratham Kumar Singh Rathore	32	17	49	65.31
45	1608210115	Pratiksha Sahani	32	17	49	65.31
46	1608210116	Prerna Arya	38	11	49	77.55
47	1608210117	Priyam Tyagi	35	14	49	71.43
48	1608210118	Puru Raj Singh	31	18	49	63.27
49	1608210119	Rachit Gahlot	24	25	49	48.98
50	1608210120	Rajat Diwakar	28	21	49	57.14
51	1608210122	Rashi Sharma	30	19	49	61.22
52	1608210123	Ravi Kumar Sagar	17	32	49	34.69
53	1608210124	Reetika Gupta	32	17	49	65.31
54	1608210125	Rishabh Agarwal	37	12	49	75.51
55	1608210126	Rishabh Chandok	31	18	49	63.27
56	1608210127	Rishabh Chauhan	36	13	49	73.47
57	1608210128	Rishav Chaba	33	16	49	67.35
58	1608210129	Ritik Gupta	39	10	49	79.59

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In Pursuit of Excellence	**Record of Monthly Attendance**	SESSION-2019-2020 SEM- 7th

Attendance Register. Dates From: 03-08-2019 to 21-11-2019

Paper Code - RCS-701

• Session: 2019-2020 • Course: B.Tech • Year: 4th • Section: C

S. No.	Roll Number	Name	(P)	(A)	Tot.	Tot. (%age)
1	1508210084	Mohd Shuaib	25	26	51	49.02
2	1508210137	Shubham Saini	20	31	51	39.22
3	1508210156	Tarun Srivastava	18	33	51	35.29
4	1608210130	Ritish Varshney	29	22	51	56.86
5	1608210131	Ritvik Rastogi	41	10	51	80.39
6	1608210133	S M Shanawar	29	22	51	56.86
7	1608210134	Sachin Singh	36	15	51	70.59
8	1608210135	Sakshi Agarwal	32	19	51	62.75
9	1608210136	Sakshi Gaur	37	14	51	72.55
10	1608210137	Sakshi Saxena	38	13	51	74.51
11	1608210138	Samarth Goel	39	12	51	76.47
12	1608210139	Sameeksha Vishnoi	36	15	51	70.59
13	1608210140	Samra Azeem	42	9	51	82.35
14	1608210141	Sarthak Agarwal	39	12	51	76.47
15	1608210142	Satyam Agarwal	32	19	51	62.75
16	1608210143	Saumya Agarwal	36	15	51	70.59
17	1608210145	Shafaque Naz	33	18	51	64.71
18	1608210147	Shashank Yadav	28	23	51	54.9
19	1608210148	Shipra Dhingra	30	21	51	58.82
20	1608210149	Shivam Srivastava	37	14	51	72.55
21	1608210150	Shivam Anand	33	18	51	64.71
22	1608210151	Shivansh Narayan	38	13	51	74.51
23	1608210152	Shreya Mishra	44	7	51	86.27
24	1608210153	Shubham	38	13	51	74.51
25	1608210154	Shubham Bhatt	31	18	49	63.27
26	1608210155	Shubham Chauhan	34	15	49	69.39
27	1608210156	Shubham Gupta	38	11	49	77.55
28	1608210157	Shubham Gupta	31	18	49	63.27
29	1608210158	Shubham Kumar	25	24	49	51.02
30	1608210159	Shubham Kumar Chitransh	31	18	49	63.27

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31	1608210160	Subham Kumar Singh	23	26	49	46.94
32	1608210161	Shubham Sharma	38	11	49	77.55
33	1608210162	Shubhi Jain	32	17	49	65.31
34	1608210163	Sonali Saxena	29	20	49	59.18
35	1608210164	Sonam Sehrawat	32	17	49	65.31
36	1608210165	Soumya Goel	34	15	49	69.39
37	1608210167	Sugandh Sisodia	34	15	49	69.39
38	1608210169	Twinkle Rastogi	35	14	49	71.43
39	1608210170	Udita Bansal	35	14	49	71.43
40	1608210171	Utkarsh Saxena	25	24	49	51.02
41	1608210172	Utkarsh Mishra	29	20	49	59.18
42	1608210173	Vaibhav Kumar	25	24	49	51.02
43	1608210174	Vaishnavi Raman Dwivedi	22	27	49	44.9
44	1608210175	Vansh Gupta	27	22	49	55.1
45	1608210176	Vardhan Shukla	31	18	49	63.27
46	1608210177	Varun Kumar Tomar	42	9	51	82.35
47	1608210178	Vedant Saxena	47	4	51	92.16
48	1608210180	Vikalp Saxena	39	12	51	76.47
49	1608210181	Vikash Kumar	37	14	51	72.55
50	1608210182	Vishal	41	10	51	80.39
51	1608210183	Vishal Bhatnagar	28	23	51	54.9
52	1608210184	Vishal Diwakar	32	19	51	62.75
53	1608210185	Vishal Rawat	25	26	51	49.02
54	1608210186	Vivek Shrestha	44	7	51	86.27
55	1608210187	Yuvraj Singh Rana	32	19	51	62.75
56	1708210902	Hardik Kumar Singh	27	24	51	52.94
57	1708210903	Kiran	27	24	51	52.94
58	1708210904	Fiza Khan	35	16	51	68.63
59	1708210905	Megha Gunjan	37	14	51	72.55
60	1708210906	Pooja Gola	41	10	51	80.39

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In Pursuit of Excellence	List of Students having short attendance before CT-3	SESSION-2019-2020 SEM- VII

Distributed Systems RCS-701 **Section B,C**

S NO	ROLL NO	NAME	SECTION	PERCENTAGE
1.	1608210069	Isha Sethi	B	58
2.	1608210070	Jaideep Choudhary	B	54
3.	1608210074	Lalit Gupat	B	54
4.	1608210082	Mohammad Anzar	B	54
5.	1608210084	Mohd Aqdus	B	58
6.	1608210088	Mohd Tabrez Khan	B	48
7.	1608210089	Mohd Umar	B	48
8.	1608210090	Mukti	B	53.06
9.	1608210096	Neelendra Kumar	B	53.06
10.	1608210099	Nidhi Patel	B	53.06
11.	1608210106	Nusrat Ali	B	53.06
12.	1608210108	Parth Garg	B	48.98
13.	1608210119	Rachit Gahlot	B	48.98
14.	1608210120	Rajat Diwakar	B	57.14
15.	1608210123	Ravi Kumar Sagar	B	34.69
16.	1508210084	Mohd Shuaib	C	49.02
17.	1508210137	Shubham Saini	C	39.22
18.	1508210156	Tarun Srivastava	C	35.29
19.	1608210147	Shashank Yadav	C	54.9
20.	1608210158	Shubham Kumar	C	51.02
21.	1608210160	Subham Kumar Singh	C	46.94
22.	1608210171	Utkarsh Saxena	C	51.02
23.	1608210173	Vaibhav Kumar	C	51.02
24.	1608210174	Vaishnavi Raman Dwivedi	C	44.9
25.	1608210175	Vansh Gupta	C	55.1
26.	1608210183	Vishal Bhatnagar	C	54.9
27.	1608210185	Vishal Rawat	C	49.02
28.	1708210902	Hardik Kumar Singh	C	52.94
29.	1708210903	Kiran	C	52.94

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MORADABAD INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
SESSIONAL TEST 3
SET-1

Course: B.Tech.
Session: 2019-2020
Subject: Distributed System
Max. Marks: 20

Semester: 7th
Section: A,B,C
Subject Code: RCS-701
Time: 1hr 15 min

Q.No. :	1	2	3	4	5	6
CO No. :	CO4	CO5	CO4	CO5	CO4	CO5

Section A (4 Marks)

Q1. Compare the working of forward recovery and backward recovery. 2 Mark

Q2. Compare flat transactions with nested transactions. 2 Mark

Section B (6 Marks)

Q3. Elucidate fault tolerance procedure. Illustrate its characteristics. 3 Mark

Q4. Explain the '**Lost Update' problem** and the '**Inconsistent Retrievals' Problem** in concurrent transactions in the context of the banking example. 3 Mark

Section C (10 Marks)

Q5. Illustrate Two phase commit protocol algorithm along with its diagram. How three phase commit protocol is different from two phase commit protocol? 5 Mark

Q6. In reference with concurrency control , point out the concepts of static voting and dynamic voting. 5 Mark

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MA

MORADABAD INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
SESSIONAL TEST 3
SET-2

Course: B.Tech.
Session: 2019-2020
Subject: Distributed System
Max. Marks: 20

Semester: 7th
Section: A,B,C
Subject Code: RCS-701
Time: 1hr 15 min

Q.No. :	1	2	3	4	5	6
CO No. :	CO4	CO5	CO4	CO5	CO4	CO5

Section A (4 Marks)

Q1. Explain the concept of Domino Effect.? 2 Mark

Q2. Explain "**Premature write**" associated with aborting transactions. 2 Mark

Section B (6 Marks)

Q3. Elucidate checkpointing in message passing system. Point out the process of checkpointing Algorithm in asynchronous checkpointing scheme. 3 Mark

Q4. Explain the '**Lost Update' problem** and the '**Inconsistent Retrievals' Problem** in concurrent transactions in the context of the banking example. 3 Mark

Section C (10 Marks)

Q5. Illustrate Two phase commit protocol algorithm along with its diagram. How three phase commit protocol is different from two phase commit protocol? 5 Mark

Q6. Illustrate the concept of Voting protocol? Differentiate between Static Voting and Dynamic voting protocols. 5 Mark

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MORADABAD INSTITUTE OF TECHNOLOGY, MORADABAD
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
CLASS TEST 3 SOLUTION (7th semester)
SET-1

Course: B.Tech. **Semester: 7th**
Session: 2019-2020 **Section: A,B,C**
Subject Name: Distributed System **Subject Code: RCS-701**

Q.1. Compare the working of forward recovery and backward recovery.

A.1. There are two approaches for restoring an erroneous state to an error free state.

1. Forward Error Recovery- If the nature of errors and damages caused by faults can be completely and accurately assessed, then it is possible to remove those errors in the process's state and enable the system to move forward.
2. Backward Error Recovery- If it is not possible to foresee the nature of faults and to remove all the errors

Comparison: Forward vs. Backward error recovery

- **Backward-error recovery**
  - (+) Simple to implement
  - (+) Can be used as general recovery mechanism
  - (-) Performance penalty
  - (-) No guarantee that fault does not occur again
  - (-) Some components cannot be recovered
- **Forward-error Recovery**
  - (+) Less overhead
  - (-) Limited use, i.e. only when impact of faults understood
  - (-) Cannot be used as general mechanism for error recovery

Q.2. Compare flat transactions with nested transactions.

A.2. A client transaction becomes distributed if it invokes operations in several different servers. There are two different ways that distributed transactions can be structured: as flat transactions and as nested transactions.

- In a **flat transaction,** a client makes requests to more than one server. For example, in **Fig ahead**, transaction ***T is a flat transaction that invokes operations on objects in*** servers ***X, Y and Z. A flat client transaction completes each of its requests before going*** on to the next one. Therefore, each transaction accesses servers' objects sequentially. When servers use locking, a transaction can only be waiting for one object at a time.

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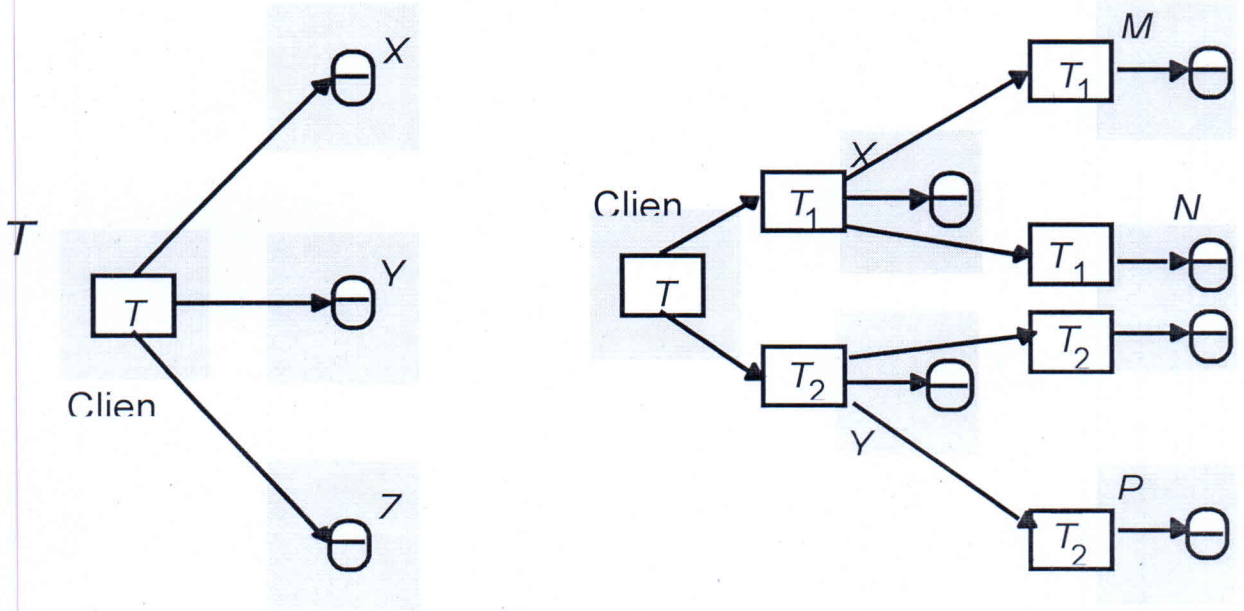
- In a **nested transaction**, the top-level transaction can open subtransactions, and each subtransaction can open further subtransactions down to any depth of nesting.
- **Fig ahead** shows a client transaction ***T*** *that opens two subtransactions,* ***T1*** *and* ***T2,*** which access objects at servers ***X*** *and* ***Y.*** *The subtransactions* ***T1*** *and* ***T2*** *open further* subtransactions ***T11, T12, T21,*** *and* ***T22,*** *which access objects at servers* ***M, N*** *and* ***P.*** *In the* nested case, subtransactions at the same level can run concurrently, so ***T1*** *and* ***T2*** *are* concurrent, and as they invoke objects in different servers, they can run in parallel. The four subtransactions ***T11, T12, T21*** *and* ***T22*** *also run concurrently.*



Q.3. Elucidate fault tolerance procedure. Illustrate its characteristics.

A.3. **Fault tolerance** is the ability of a system to perform its function correctly even in the presence of internal faults. The purpose of fault tolerance is to increase the dependability of a system. A complementary but separate approach to increasing dependability is ***fault prevention***. This consists of techniques, such as inspection, whose intent is to eliminate the circumstances by which faults arise. To avoid disruptions due to failures and to improve availability, systems are designed to be fault tolerant.

A system can be designed to be fault tolerant in **two ways**. A system may **mask failures (voting protocols)** or a system may exhibit a **well defined failure behavior(commit protocols)** in the event of failure. When a system is designed to **mask failures**, it continues to perform its specified function in the event of a failure.

A system designed for **well defined behavior** may or may not perform the specified function in the event of a failure, however, it can facilitate actions suitable for recovery.

The basic characteristics of fault tolerance require:

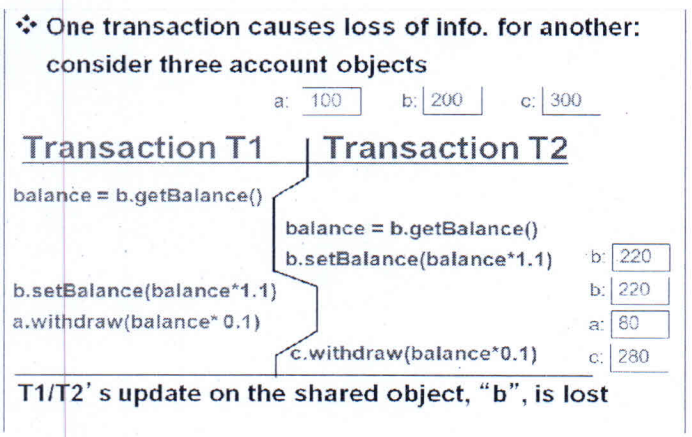
- No single point of failure .
- No single point of repair.

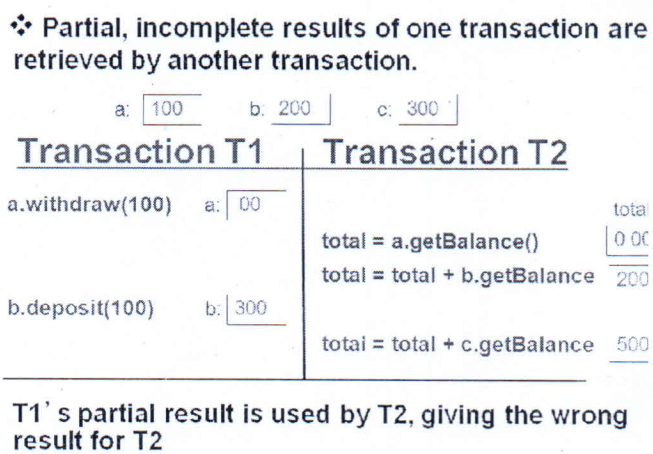
- Fault isolation to the failing component.
- Fault containment to prevent propagation of the failure.
- Availability of reversion modes.

Q.4. Explain the 'Lost Update' problem and the 'Inconsistent Retrievals' Problem in concurrent transactions in the context of the banking example.

A.4. Two well-known problems of concurrent transactions in the context of the banking example are – the 'lost update' problem and the 'Inconsistent Retrievals' Problem. Two well known problems of concurrent transaction can be avoided by using serially equivalent execution of transaction (discussed ahead).

- The Lost Update Problem: The lost update problem is illustrated by the following pair of transactions on bank accounts *A, B and C, whose initial balances are $100, $200 and* $300, respectively. Transaction *T1 transfers an amount from account A to account B.* Transaction *T2 transfers an amount from account C to account B. In both cases, the* amount transferred is calculated to increase the balance of *B by 10%. The net effects on* account *B of executing the transactions T1 and T2 should be to increase the balance of* account *B by 10% twice, so its final value is $242.* Now consider the effects of allowing the transactions *T1 and T2 to run concurrently,* as in Figure ahead. Both transactions get the balance of *B as $200 and then deposit $20.* The result is incorrect, increasing the balance of account *B by $20 instead of $42. This* is an illustration of the 'lost update' problem. T2*'s update is lost because T1 overwrites it* without seeing it. Both transactions have read the old value before either writes the new value.





- The Inconsistent Retreivals Problem: Figure ahead shows another example related to a bank account in which transaction *V transfers a sum from account A to B and transaction W invokes* the *branchTotal method to obtain the sum of the balances of all the accounts in the bank* The balances of the two bank accounts, *A and B, are both initially $100. The result of branchTotal includes the sum of A and B as $500, which is wrong. This is an illustration* of the 'inconsistent retrievals' problem. *W's retrievals are inconsistent because V has* performed only the withdrawal part of a transfer at the time the sum is calculated.

Q.5. Illustrate Two phase commit protocol algorithm along with its diagram. How three phase commit protocol is different from two phase commit protocol?
A.5. Refer to notes and slides.

Q.6. In reference with concurrency control , point out the concepts of static voting and dynamic voting.
A.6. Refer to notes and slides.

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Subject Teacher: Ms. Prachi Gupta

MIT Group of Institutions, Moradabad

ATTENDANCE SHEET

Session: 2019-20 Class Test I / II / III

Date: 29/11/19 **Shift:** IInd **Room No:** D303

Year: 4th **Semester:** 7th **Section/Branch:** B / CS

Subject Name: Distributed System **Subject Code:** RCS701

S. No	Roll No	Name of Student	Branch	Signature
1.	1608210064	Manshika Madnok	CS	Manshika
2.	1608210066	Himanshu Agnihotri	CS	Himanshu
3.	1608210068	Hrithik Sisodia	CS	Hisodia
4.	1608210069	Isha Sethi	CS	Isha
5.	1608210070	Jaideep Choudhary	CS	Jaideep choudhary
6.	1608210074	Lalit Gupta	CS	Lalit Gupta
7	1608210080	Milan Vishnoi	CS	Milan Vishnoi
8.	1608210081	Mohammad Anas	CS	Anas
9	1608210082	Mohammad Anzar	CS	Anzar
10.	1608210084	Mohd Aqdas	CS	Mohd Aqdas
11.	1608210086	Mohd Bilal	CS	Mohd Bilal
12.	1608210088	Mohd. Tabrez Khan	CS	Gabrez Khan
13.	1608210089	Mohd Umar	CS	Umar
14.	1608210090	Mukti	CS	Mukti
15.	1608210093	Muskan chaddha	CS	MC
16.	1608210098	Neha Srivastava	CS	N
17.	1608210099	Nidhi Patel	CS	NP
18.	1608210071			
19.	73			
20.	75			
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23.	78			
24.	79			
25.	92			
26.	94			
27.	95			
28.	96			
29.	97			
30.				

(12) ABSENT

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Total No. of Students allotted in Room: (29) Students Absent: (12) Students Present: (17)

Invigilators: 1) Name Atul Kumar Sign:

2) Name Hanendra Nath Pandey Sign:

Subject Teacher: Ms. PRACHI GUPTA ~~PRAVEEN SAKHAL~~

MIT Group of Institutions, Moradabad

ATTENDANCE SHEET

Session: 2019-20 Class Test I / II / III ✓

Date: 29.11.2019 Shift: I Room No: D-306

Year: IV Semester: VII Section/Branch: B/CS

Subject Name: DISTRIBUTED SYSTEM Subject Code: RCS-701

S. No	Roll No.	Name of Student	Branch	Signature
1.	1608210100	Nikhil Kumar I	CSE	Nikhil
2.	1608210102	Nimisha	CSE	Nimisha
3.	1608210103	Nishant Pal	CSE	Nishant Pal
4.	1608210105	Nishtha Varshney	CSE	Nishtha
5.	1608210112	Prakhar Kumar Gautam	CSE	Prakhar
6.	1608210111	Prakhar Agarwal	CSE	Prakhar
7.	1608210109	Piyush Diwakar	CSE	Piyush
8.	1608210107	Paras Dhawan	CSE	Paras
9.	1608210115	Pratiksha Sahani	CSE	Pratiksha
10.	1608210117	Priyam Tyagi	CSE	Priyam
11.	1608210119	Rachit Gahlot	CSE	Rachit
12.	1608210120	Rajat Diwakar	CSE	Rajat
13.	1608210129	Ritik Gupta	CSE	Ritik
14.	1608210128	Rishav Choba	CSE	Rishav
15.	1608210126	Rishabh Chandak	CSE	Rishabh
16.	1608210124	Rekha Gupta	CS	Rekha
17.	1608210122	Rashi Sharma	CSE	Rashi
18.				
19.	1608210101	Nikhil Kumar II	CSE	Nikhil
20.	104			
21.	106			
22.	110			
23.	113	Absent.		
24.	114			
25.	116			
26.	118			
27.	127			
28.	125			
29.				
30.				

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Moradabad-244001

Total No. of Students allotted in Room: 27 Students Absent: 09 Students Present: ~~16~~ 18

Invigilators: 1) Name Mr. VIPIN KUMAR Sign:

2) Name Mr. SHUBHAM VYAS Sign:

89 112

Rec I

Subject Teacher..... Prachi Gupta

MIT Group of Institutions, Moradabad

ATTENDANCE SHEET

Session: 2019-20

Class Test I / II / III ✓

Date: ...3/12/19..... **Shift:** .....I..... **Room No:** ...B-114.....

Year: .....4th..... **Semester:** .....7th..... **Section/Branch:** ....B.I.C.S..

Subject Name: ..Distributed System..... **Subject Code:** ...RCS-701..

S. No	Roll No.	Name of Student	Branch	Signature
1.	1608210078	Manisha Singh	CS	
2.				
3.				
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Dr. Somesh Kumar
Prof. & Head, CSE
Moradabad Institute of Technology
Moradabad-244001

Total No. of Students allotted in Room: _____ **Students Absent:** _____ **Students Present:** _____

Invigilators: 1) Name_____ **Sign:**_____

2) Name_____ **Sign:**_____

~~90~~ 113

Subject Teacher.. Ms. Prachi Gupta.

MIT Group of Institutions, Moradabad

ATTENDANCE SHEET

Session: 2019-20 Class Test I / II / III

Date: 29/11/19 Shift: 1st. Room No: B-311

Year: 4th Semester: 7th. Section/Branch: C/CSE

Subject Name: Distributed system. Subject Code: RCS-701

S No	Roll No.	Name of Student	Branch	Signature
1.	1608210163	Sonali Saxena	CS	Sonali
2.	1608210164	Sonam Shekawat	CSE	Sonam
3.	1608210167	Sugandh Sisodia	CSE	Sugandh
4.	1608210171	Utkarsh Saxena	CSE	US
5.	1608210172	Utkarsh Mishra	CSE	Utkarsh
6.	1608210173	Vaibhav Kumar	CSE	Vaibhav
7.	1608210174	Vaishnavi Dwivedi	CSE	Vaishnavi
8.	1608210175	Vanshi Gupta	CSE	Vanshi
9.	1608210177	Varun Kr Tomar	CSE	Varun
10.	1608210180	Vikalp Saxena	CSE	Vikalp
11.	1608210181	Vikash kumar	CSE	Vikash
12.	1608210183	Vishal Bhatnagar	CSE	Vishal
13.	1608210184	Vishal Diwakar	CSE	Vishal
14.	1608210185	Vishal Rawat	CSE	Vishal
15.	1608210186	Vivek Shrestha	CSE	Vivek
16.	1608210187	Yuvraj Singh Rana	CSE	Yuvraj
17.	1708210902	Hardik kumar Singh	CSE	Hardik
18.	1708210903	Kiran	"	Kiran
19.	1708210905	Megha Gunjan	CSE	Megha
20.	1608210165			
21.	169			
22.	170			
23.	176			
24.	178	ABSENT		
25.	182			
26.	1508210084			
27.	1708210904			
28.	906			
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Dr. Somesh Kumar
Prof. & Head, CSE
Moradabad Institute of Technology
Moradabad-244001

Total No. of Students allotted in Room: 28 Students Absent: 09 Students Present: 19

Invigilators: 1) Name Dr. Parul Gupta. Sign:

2) Name Mohd. Ilyas Sign: 29/11

Subject Teacher: Ms. Prachi Gupta

MIT Group of Institutions, Moradabad

ATTENDANCE SHEET

Session: 2019-20 | Class Test I / II / III

Date: 29/11/19 | Shift: 1st | Room No: B-309

Year: 4th | Semester: 7th | Section/Branch: C

Subject Name: Distributed System | Subject Code: RCS-701

S. No	Roll No.	Name of Student	Branch	Signature
1.	1608210130	Ritish Varshney	CSE	Ritish
2.	1608210134	Sahin Singh	CSE	Sahin
3.	1608210135	Sakshi Agarwal	CSE	Sagl
4.	1608210140	Samra Azeem	CSE	Samra.
5.	1608210142	Satyam Agarwal	CSE	Sam.
6.	1608210145	Shafaque Naz	CSE	Shafaque
7	1608210151	Shivansh Narayan	CSE	Shivansh
8.	1608210149	Shivam Srivastava	C.S.E	Shivam
9	1608210148	Shipra dhingra	CSE	Shipra
10.	1608210147	Shashank yadav	CSE	Sha
11.	1608210152	Shreya Mishra	CS&E	Shreya.
12.	1608210154	Shubham Bhatt	CSE	SBhatt
13.	1608210150	Shubham kumar	CSE	Shubham.
14.	1608210159	Shubham Kumar Chitransh	"	Shubham
15.	1608210161	Shubham Sharma	CSE	Shubham
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17.	33			
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20.	38	(15) ABSENT		
21.	39			
22.	41			
23.	43			
24.	50			
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26.	55			
27	56			
28	57			
29.	60			
30.	62			

Dr. Somesh Kumar
Prof. & Head, CSE
Moradabad Institute of Technology
Moradabad-244001

Total No. of Students allotted in Room: 30 | Students Absent: 15 | Students Present: 15

Invigilators: 1) Name Kanchan Sign: Kanchan

2) Name Bhavya N. Vats Sign:

Subject Teacher: Prachi Gupta

MIT Group of Institutions, Moradabad

ATTENDANCE SHEET

Session: 2019-20

Class Test I / II / III (Re)

Date: 3/12/2019 **Shift:** I **Room No:** B-114

Year: 4th **Semester:** 7th **Section/Branch:** C/CS

Subject Name: Distributed System **Subject Code:** RCS-701

S. No	Roll No.	Name of Student	Branch	Signature
1.	1508210156	TARUN SRIVASTAVA	CSE	
2.	1608210182	Vishal	CSE	Vishal
3.	1508210137	Shubham Saini	CSE	
4.	1608210174	Vaishnavi	CSE	
5.	1608210157	Shubham Gupta	CSE	Shubham
6.	1608210155	Shubham Chauhan	CSE	
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Dr. Somesh Kumar
Prof. & Head, CSE
Moradabad Institute of Technology
Moradabad-244001

Total No. of Students allotted in Room: _____ Students Absent: _____ Students Present: _____

Invigilators: 1) Name _____ Sign: _____

2) Name _____ Sign: _____

Subject Teacher: Anurag Malik

MIT Group of Institutions, Moradabad

ATTENDANCE SHEET

Session: 2019-20

Class Test I / II / III

Date: ..... **Shift:** I **Room No:** B-120

Year: 4th **Semester:** 7th **Section/Branch:** B.Tech CS

Subject Name: Distributed System **Subject Code:** RCS-701

S. No	Roll No.	Name of Student	Branch	Signature
1.	160821090	MUKTI	CS	Mukti
2.	160821098	Neha Srivastava	CSE	Neha
3.	160821089	Mohd Umar	CSE	
4.	160821073	Kshitiz Saxena	CSE	Kshitiz
5.	160821108	Parth Garg	I.S.E	Parth
6.	160821012	Prakhar Kumar Gautam	CSE	Prakhar
7.	160821010 6	Nusrat Ali	CSE	Nusrat Ali
8.	160821009 6	Neelendra Kumar	CSE	Neelendra
9.	160821012 8	Ravi Sagar	CSE	Ravi
10.	160821008 6	Mohd Bilal	CSE	Mohd Bilal
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Dr. Somesh Kumar
Prof. & Head, CSE
Moradabad Institute of Technology
Moradabad-244001

Total No. of Students allotted in Room: _____ Students Absent: _____ Students Present: _____

Invigilators: 1) Name _____ Sign: _____

2) Name _____ Sign: _____

Subject Teacher.....

MIT Group of Institutions, Moradabad

ATTENDANCE SHEET

Session: 2019-20

Class Test I / II / III

Date: ..... **Shift:** I **Room No:** B-120

Year: 4th **Semester:** 7th **Section/Branch:** C.S.E / C.S

Subject Name: Distributed System **Subject Code:** RCS-701

S. No	Roll No.	Name of Student	Branch	Signature
1.	1608210139	Sameeksha Vishnoi	CSE	Sami.
2.	1608210171	Utkarsh Saxena	CSE	UtkarshSaxena
3.	1608210160	Subham kumar Singh	CSE	Subham
4.	1608210184	Vishal diwakar	CSE	
5.	1608210175	Vansh Gupta	CSE	Vans
6.	1508210084	Mohd Shuaib	CSE	shaw
7.	1608210185	Vishal Rawat	CS	Rawat
8.	1608210158	Shubham kumar	C.S	Shubham
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Dr. Somesh Kumar
Prof. & Head, CSE
Moradabad Institute of Technology
Moradabad-244001

Total No. of Students allotted in Room: _____ **Students Absent:** _____ **Students Present:** _____

Invigilators: 1) Name _____ **Sign:** _____

2) Name _____ **Sign:** _____

In Pursuit of Excellence	Class Test 3 Marks	SESSION-2019-2020	SEM- 7th
Sno.	Roll No.	Name of Students	TOTAL(20)
1	1608210064	Harshita Madhok	17
2	1608210066	Himanshu Agnihotri	18
3	1608210068	Hrithik Sisodia	19
4	1608210069	Isha Sethi	18
5	1608210070	Jaideep Choudhary	13
6	1608210071	Juhi Rastogi	0
7	1608210073	Kshitiz Saxena	14
8	1608210074	Lalit Gupta	16
9	1608210075	Manas Munjial	A
10	1608210076	Manik Agarwal	A
11	1608210077	Manish Singh Bisht	A
12	1608210078	Manisha Singh	16
13	1608210079	Mansi Tyagi	A
14	1608210080	Milan Vishnoi	19
15	1608210081	Mohammad Anas	19
16	1608210082	Mohammad Anzar	7
17	1608210084	Mohd. Aqdus	15
18	1608210086	Mohd. Bilal	16
19	1608210088	Mohd. Tabrez Khan	4
20	1608210089	Mohd Umar	3
21	1608210090	Mukti	4
22	1608210092	Muskan	A
23	1608210093	Muskan Chaddha	19
24	1608210094	Muskan Mathur	0
25	1608210095	Nandni Shishodiya	0
26	1608210096	Neelendra Kumar	20
27	1608210097	Neetesh	A
28	1608210098	Neha Srivastava	16
29	1608210099	Nidhi Patel	11
30	1608210100	Nikhil Kumar S/O PK	17
31	1608210101	Nikhil Kumar S/O RK	12
32	1608210102	Nimisha	11
33	1608210103	Nishant Pal	13
34	1608210104	Nishkarsh Krishan	A
35	1608210105	Nishtha Varshney	14
36	1608210106	Nusrat Ali	17
37	1608210107	Paras Dhawan	19
38	1608210108	Parth Garg	19
39	1608210109	Piyush Diwaker	14
40	1608210110	Piyushi Saraswat	A
41	1608210111	Prakhar Agarwal	8
42	1608210112	Prakhar Kumar Gautam	7
43	1608210113	Prashant Varshney	A
44	1608210114	Pratham Kumar Singh Rathore	A
45	1608210115	Pratiksha Sahani	19
46	1608210116	Prerna Arya	A
47	1608210117	Priyam Tyagi	12
48	1608210118	Puru Raj Singh	A
49	1608210119	Rachit Gahlot	16
50	1608210120	Rajat Diwakar	10
51	1608210122	Rashi Sharma	18
52	1608210123	Ravi Kumar Sagar	19
53	1608210124	Reetika Gupta	18
54	1608210125	Rishabh Agarwal	A
55	1608210126	Rishabh Chandok	19
56	1608210127	Rishabh Chauhan	A
57	1608210128	Rishav Chaba	18
58	1608210129	Ritik Gupta	19

Dr. Somesh Kumar
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In Pursuit of Excellence	Class Test 3 Marks	SESSION-2019-2020	SEM- 7th
Sno.	Roll No.	Name of Students	TOTAL(20)
1	1608210130	Ritish Varshney	17
2	1608210131	Ritvik Rastogi	A
3	1608210133	S.M.Shanawar	A
4	1608210134	Sachin Singh	18
5	1608210135	Sakshi Agarwal	19
6	1608210136	Sakshi Gaur	0
7	1608210137	Sakshi Saxena	0
8	1608210138	Samarth Goel	0
9	1608210139	Sameeksha Vishnoi	16
10	1608210140	Samra Azeem	19
11	1608210141	Sarthak Agarwal	A
12	1608210142	Satyam Agarwal	16
13	1608210143	Saumya Agarwal	A
14	1608210145	Shafaque Naz	19
15	1608210147	Shashank Yadav	17
16	1608210148	Shipra Dhingra	18
17	1608210149	Shivam Srivastva	15
18	1608210150	Shivam Anand	A
19	1608210151	Shivansh Narayan	15
20	1608210152	Shreya Mishra	17
21	1608210153	Shubham	A
22	1608210154	Shubham Bhatt	14
23	1608210155	Shubham Chauhan	17
24	1608210156	Shubham Gupta S/O A.K.G	A
25	1608210157	Shubham Gupta S/O S.K.G	20
26	1608210158	Shubham Kumar	13
27	1608210159	Shubham Kumar Chitransh	16
28	1608210160	Subham Kumar Singh	19
29	1608210161	Shubham Sharma	13
30	1608210162	Shubhi Jain	A
31	1608210163	Sonali Saxena	18
32	1608210164	Km Sonam Sehrawat	16
33	1608210165	Soumya Goel	A
34	1608210167	Sugandh Sisodia	15
35	1608210169	Twinkle Rastogi	A
36	1608210170	Udita Bansal	A
37	1608210171	Utkarsh Saxena	14
38	1608210172	Utkarsh Mishra	17
39	1608210173	Vaibhav Kumar	17
40	1608210174	Vaishnavi Raman Dwivedi	19
41	1608210175	Vansh Gupta	11
42	1608210176	Vardaan Shukla	A
43	1608210177	Varun Kumar Tomar	19
44	1608210178	Vedant Saxena	A
45	1608210180	Vikalp Saxena	16
46	1608210181	Vikash Kumar	13
47	1608210182	Vishal	17
48	1608210183	Vishal Bhatnagar	16
49	1608210184	Vishal Diwakar	7
50	1608210185	Vishal Rawat	9
51	1608210186	Vivek Shrestha	16
52	1608210187	Yuvraj Singh Rana	14
53	1508210137	Shubham Saini	20
54	1508210156	Tarun Srivastava	20
55	1508210084	Mohd. Shuaib	14
56	1708210902	Hardik Kumar Singh	17
57	1708210903	Kiran	17
58	1708210904	Fiza Khan	A
59	1708210905	Megha Gunjan	8
60	1708210906	Pooja Gola	A

Dr. Somesh Kumar
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Moradabad Institute of Technology
Moradabad-244001

In Pursuit of Excellence	**List of Weak Students** (Action taken for Improvement)	SESSION-2019-2020 SEM-VII

BASED ON CT-3 MARKS

S.No.	Roll No.	Name	Marks	Section
1	1608210071	Juhi Rastogi	0	B
2	1608210088	Mohd. Tabrez Khan	4	B
3	1608210089	Mohd Umar	3	B
4	1608210090	Mukti	4	B
5	1608210094	Muskan Mathur	0	B
6	1608210095	Nandni Shishodiya	0	C
7	1608210136	Sakshi Gaur	0	C
8	1608210137	Sakshi Saxena	0	C
9	1608210138	Samarth Goel	0	C

* Provided question bank with necessary questions for weak students.

Dr. Somesh Kumar
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Moradabad-244001

In Pursuit of Excellence	**List of Bright Students** (Action taken for Improvement)	SESSION-2019-2020 SEM- VII

BASED ON CT-3 MARKS

S.No.	Roll No.	Name	Marks	Section
1	1608210066	Himanshu Agnihotri	18	B
2	1608210068	Hrithik Sisodia	19	B
3	1608210069	Isha Sethi	18	B
4	1608210080	Milan Vishnoi	19	B
5	1608210081	Mohammad Anas	19	B
6	1608210093	Muskan Chaddha	19	B
7	1608210096	Neelendra Kumar	20	B
8	1608210107	Paras Dhawan	19	B
9	1608210108	Parth Garg	19	B
10	1608210115	Pratiksha Sahani	19	B
11	1608210122	Rashi Sharma	18	B
12	1608210123	Ravi Kumar Sagar	19	B
13	1608210124	Reetika Gupta	18	B
14	1608210126	Rishabh Chandok	19	B
15	1608210128	Rishav Chaba	18	B
16	1608210129	Ritik Gupta	19	B
17	1608210134	Sachin Singh	18	C
18	1608210135	Sakshi Agarwal	19	C
19	1608210140	Samra Azeem	19	C
20	1608210145	Shafaque Naz	19	C
21	1608210148	Shipra Dhingra	18	C
22	1608210157	Shubham Gupta S/O S.K.G	20	C
23	1608210160	Subham Kumar Singh	19	C
24	1608210163	Sonali Saxena	18	C
25	1608210174	Vaishnavi Raman Dwivedi	19	C
26	1608210177	Varun Kumar Tomar	19	C
27	1508210137	Shubham Saini	20	C
28	1508210156	Tarun Srivastava	20	C

* Guiding the students for GATE / Competitive Exams.

Dr. Somesh Kumar
Prof. & Head, CSE
Moradabad Institute of Technology
Moradabad-244001

Printed Pages:2 | Sub Code: NCS701

Paper Id: 110713 | Roll No. | | | | | | | | | | |

B.TECH
(SEM VII) THEORY EXAMINATION 2018-19
DISTRIBUTED SYSTEMS

Time: 3 Hours | *Total Marks: 100*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

a. What are the web Challenges involved in distributed system.
b. Explain system model.
c. What is distributed Deadlock?
d. What do you mean by commit protocol
e. State time stamp ordering.
f. Explain the concept of shared memory
g. Define fault and failure in distributed system
h. Explain token based algorithm
i. What do you mean by agreement protocol?
j. Explain the effect of replicated data in transactions.

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

a. State the Classification of distributed mutual exclusion. What is requirement of mutual exclusion theorem?
b. What do you understand by Byzantine agreement problem?
c. Give the Design issues in Distributed Shared Memory state the Algorithm for Implementation of Distributed Shared Memory.
d. Explain the limitations of Distributed system with example.
e. Define forward and backward recovery. Also list the advantages and disadvantages of both.

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

(a) What is token based algorithm and non-token based algorithm in Distributed system? Explain with example.
(b) What are Distributed Systems? What are significant advantages and applications of Distributed Systems?

4. Attempt any *one* part of the following: **10 x 1 = 10**

(a) What are Lamport logical clocks? List the important conditions to be satisfied by Lamport logical clocks. Discuss the limitations of Lamport logical clocks.
(b) Explain the mechanism of building distributed file systems also explain the Design issues in Distributed Shared Memory.

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Printed Pages: 02 Sub Code: ECS701

Paper ID: 1 0 2 9 Roll No.

B.TECH
(SEM. VII) THEORY EXAMINATION 2017-18
DISTRIBUTED SYSTEM

Time: 3Hours *Max. Marks: 100*

Note: Attempt all Sections. Assume missing data, if any.

SECTION A

1. Attempt *all* questions in brief. 10x2 = 20

a. Why would you design a system as a distributed system? List some advantages of distributed systems.
b. List three properties of distributed systems.
c. What is the advantage if your server side processing uses threads instead of a single process?
d. What is a proxy? Give an example of where a proxy can be used.
e. What are the differences between a local call and a remote call?
f. What is the purpose of a firewall?
g. What were the reasons that middleware moved from distributed objects to distributed components?
h. Name two mechanisms that can be used to ensure performance in distributed systems.
i. What are the differences between a URL, URI and URN?
j. What is atomic commit protocol?

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a. What is distributed transparency? Explain the different types of distributed transparencies.
b. Explain shared memory architecture and distributed memory architecture.
c. Describe Byzantine agreement problem, and explain its solution. Show that Byzantine agreement cannot always be reached among four processors if two processors are faulty.
d. Discuss the major issue in designing a distributed system.
e. What is Mutual Exclusion? Describe the requirements of mutual exclusion in distributed system. Is mutual exclusion problem more complex in distributed system than single computer system? Justify your answer.

SECTION C

3. Attempt any *two* parts of the following: 5 x 2 = 10

a. Draw a schematic diagram of the distributed transaction management model. Explain each component in brief.
b. Describe three phase commit protocol. How three phase commit protocol is different than two phase commit protocol?
c. Write and explain various issues that must be addressed in design and implementation of distributed file system.

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4. Attempt any *two* parts of the following: 5 x 2 = 10

(a) What is Cache? Discuss read operation with cache and write operation with cache.
(b) Explain naming in distributed system. What is flat naming and structured naming?
(c) Classify the Deadlock detection algorithms. Describe the Path-Pushing deadlock detection algorithm.

5. Attempt any *one* part of the following: 10 x 1 = 10

(a) What are stub and skeleton and why are they needed in remote procedure calls?
(b) What is the purpose of an Interface Definition Language? Why does CORBA not just use the Java interface construct?

6. Attempt any *one* part of the following: 10 x 1 = 10

(a) How the distributed computing system is better than parallel processing system? Explain.
(b) What is termination detection in distributed system? Explain any algorithm for termination detection.

7. Attempt any *one* part of the following: 10 x 1 = 10

(a) How does a server know that one of his remote objects provided by him is no longer used by clients and can be collected? How does Java RMI handle this problem and what alternatives are there?

(b) De-activation is a technology used to preserve server resources where a server which provides remote objects to clients can de-activate those remote objects. Clients should not know about this. What must the server do to avoid surprises for the clients?

Printed Pages: 3

NCS - 701

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 2012269 Roll No.

B.TECH

Regular Theory Examination (Odd Sem - VII), 2016-17

DISTRIBUTED SYSTEM

Time : 3 Hours *Max. Marks : 100*

Section - A

1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. (10×2=20)

a) List out the main challenges of distributed systems.

b) What are logical clocks? Why does a logical clock need to be implemented in distributed systems?

c) What do you mean by mutual exclusion in distributed system? What are the requirements of a good mutual exclusion algorithm?

d) Define deadlock detection in distributed systems.

e) List out some issues in distributed file system.

f) State Byzantine agreement problem.

g) What do you mean by agreement protocol?

h) Compare and contrast static and dynamic vote protocols.

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i) Define fault and failure. What are different approaches to fault-tolerance?

j) What are the different validation conditions for optimistic concurrency control?

Section - B

Note: Attempt any five questions from this section (5×10=50)

2. i) Discuss the limitations of Lamport's logical clock with suitable example.

ii) Give the Chandy-Lamport's global state recording algorithm.

3. Discuss casual ordering of messages. Give one algorithm which can order the messages according to causal dependencies.

4. i) Differentiate between token and non token based algorithms.

ii) What are the deadlock handling strategies in distributed file systems? What is control organization for distributed deadlock detection? Discuss an algorithm which can remove phantom deadlock.

5. What are agreement protocols? Explain Byzantine agreement problem, the consensus problem and interactive consistency problem.

6. Describe in detail:

a) Dynamic voting protocols.

b) Method to obtain consistent set of checkpoint.

7. Define forward recovery and backward recovery. List advantages and disadvantages of forward recovery. Explain two approaches of backward-error recovery.

8. Explain design in use in distributed shared memory and also write algorithm for implementation of shared memory.

9. i) What are the goals of distributed transaction? Distinguish between flat and nested transaction along with its structure.

   ii) Explain optimistic concurrency control.

Section - C

Note: Attempt any two questions from this section. **(2×15=30)**

10. Describe Lamport - shostak - pease algorithm. How does vector clock overcome the disadvantages of Lamport clock? Explain with an example.

11. Discuss the following:

    a) Performance metric for distributed mutual exclusion algorithms.

    b) Obermarck's Path - Pushing algorithm.

12. Write short notes on:

    a) Flat and nested transaction

    b) 2PL and Strict 2PL.

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In Pursuit of Excellence	QUESTION BANK	SESSION-2019-2020 SEM- VII

DISTRIBUTED SYSTEM (RCS-701)

Unit-I [CO-1]

Q-1 Give five types of hardware resource and five types of data or software resource that can usefully be shared.

Q-2 What do you mean by Distributed System?

Q-3 What are the characteristics of Distributed System?

Q-4 What are Vector Clocks?

Q-5 What are advantages of Vector clock over Lamport Logical Clock

Q-6 What do you mean by Causal Ordering of messages?

Unit-II [CO-2]

Q-7 What do you mean by Distributed Mutual Exclusion?

Q-8 Explain the control organization for Distributed deadlock detection.

Q-9 Explain the deadlock handling strategies in distributed system.

Q-10 What are the Phantom Deadlocks?

Q-11 What are the shortcomings of Ramamoorthy's two phase algorithm for deadlock detection?

Q-12 How does one phase algorithm remove the possibility of false deadlock detection?

Unit-III [CO-3]

Q-13 What are the Agreement and validity objectives of Byzantine Agreement Problems?

Q-14 What are the Agreement protocols?

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Q-15 Discuss the architecture of a distributed file system.

Q-16 What are the goals of Distributed File System?

Q-17 What are the mechanism for building distributed file system?

Q-18 Discuss mounting ,caching and hints in brief.

Unit-IV [CO-4]

Q-19 What is atomic commit in distributed database system?

Q-20 Differentiate between fault, failure and error.

Q-21 What are voting protocols?

Unit-V [CO-5]

Q-22 What are the Locks?

Q-23 What are the essential differences in the Lock-based protocols and Time Stamp based protocols?

Q-24 What are the Distributed Databases?

Q-25 What are the advantages of Data distribution and Data Replication?

Q-26 Explain the difference between Horizontal and Vertical fragmentations.

Extra questions for bright students

Q-27 Discuss the web challenges for implementing distributed systems.

Q-28 What are the requirements of Mutual Exclusion Algorithms?

Q-29 Differentiate between Token based and Non-token based algorithm.

Q-30 What are the differences between deadlock and starvation?

Q-31 Differentiate between resource and communication deadlocks.

Q-32 What are distributed deadlock detection algorithms?

Q-33 What algorithmic processes are proposed for the solution of the Byzantine agreement protocol?

Q-34 What are the algorithms for implementing distributed shared memory?

Q-35 Why is concurrency control needed?

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Theory Subject Marks

Distributed Systems (RCS-701) CS B 7Semester 4th Year

Sno.	Roll No.	Name of Students	Class Test (20)				CT Total (Best of Two)	Attendance (AT 5 M)	Tutorial and Assignment (TA 5 M)	TOTAL MM : 30
			CT-1	CT-2	CT-3					
1	1608210064	Harshita Madhok	0	9.5	17		14	4	5	23
2	1608210066	Himanshu Agnihotri	0	10	18		14	4	5	23
3	1608210068	Hrithik Sisodia	0	12	19		16	4	5	25
4	1608210069	Isha Sethi	18	0	18		18	4	5	27
5	1608210070	Jaideep Choudhary	6	0	13		10	4	5	19
6	1608210071	Juhi Rastogi	16	16.5	0		17	5	5	27
7	1608210073	Kshitiz Saxena	2	12	0	14	13	4	5	22
8	1608210074	Lalit Gupta	0	9.5	16		13	4	4	21
9	1608210075	Manas Munjial	12	12.5	0		13	5	5	23
10	1608210076	Manik Agarwal	8	14	0		11	4	5	20
11	1608210077	Manish Singh Bisht	14	10.5	0		13	4	5	22
12	1608210078	Manisha Singh	15	0	16		16	5	5	26
13	1608210079	Mansi Tyagi	18	17.5	0		18	5	5	28
14	1608210080	Milan Vishnoi	16	18	19		19	5	5	29
15	1608210081	Mohammad Anas	11	16.5	19		18	5	5	28
16	1608210082	Mohammad Anzar	0	15	7		11	4	5	20
17	1608210084	Mohd. Aqdus	0	12.5	15		14	4	5	23
18	1608210086	Mohd. Bilal	0	8.5	0	16	13	4	4	21
19	1608210088	Mohd. Tabrez Khan	0	15	4		10	4	5	19
20	1608210089	Mohd Umar	0	0	3	17	10	4	5	19
21	1608210090	Mukti	2	0	4	17	11	4	4	19
22	1608210092	Muskan	8	13	0		11	4	5	20
23	1608210093	Muskan Chaddha	0	15	19		17	4	5	26
24	1608210094	Muskan Mathur	14	13	0		14	4	5	23
25	1608210095	Nandni Shishodiya	11	13	0		12	4	5	21
26	1608210096	Neelendra Kumar	0	0	0	19	10	4	5	19
27	1608210097	Neetesh	7	13	0		10	4	5	19
28	1608210098	Neha Srivastava	0	0	16	17	17	4	4	25
29	1608210099	Nidhi Patel	10	0	11		11	4	5	20
30	1608210100	Nikhil Kumar S/O PK	7	0	17		12	5	5	22
31	1608210101	Nikhil Kumar S/O RK	12	3	12		12	4	5	21
32	1608210102	Nimisha	0	11.5	11		12	4	5	21
33	1608210103	Nishant Pal	11	0	13		12	4	4	20
34	1608210104	Nishkarsh Krishan	10	8	0		9	5	5	19
35	1608210105	Nishtha Varshney	14	0	14		14	4	5	23
36	1608210106	Nusrat Ali	0	4.5	0	17	11	4	4	19
37	1608210107	Paras Dhawan	16	0	19		18	5	5	28
38	1608210108	Parth Garg	0	0	0	19	10	4	5	19
39	1608210109	Piyush Diwaker	4	0	14		9	5	5	19
40	1608210110	Piyushi Saraswat	14	14	0		14	5	5	24
41	1608210111	Prakhar Agarwal	0	12.5	8		11	4	4	19
42	1608210112	Prakhar Kumar Gautam	0	6.5	7	14	11	4	4	19
43	1608210113	Prashant Varshney	18	7	0		13	5	4	22
44	1608210114	Pratham Kumar Singh Rathore	15	15.5	0		16	4	5	25
45	1608210115	Pratiksha Sahani	12	0	19		16	4	5	25
46	1608210116	Prerna Arya	14	15.5	0		15	5	5	25
47	1608210117	Priyam Tyagi	6	7	12		10	4	5	19
48	1608210118	Puru Raj Singh	14	6.5	0		11	4	5	20
49	1608210119	Rachit Gahlot	0	9.5	16		13	4	4	21
50	1608210120	Rajat Diwakar	10	5.5	10		10	4	5	19
51	1608210122	Rashi Sharma	8	0	18		13	4	4	21
52	1608210123	Ravi Kumar Sagar	0	0	0	19	10	4	5	19
53	1608210124	Reetika Gupta	19	0	18		19	4	5	28
54	1608210125	Rishabh Agarwal	8	10	0		9	5	5	19
55	1608210126	Rishabh Chandok	0	14	19		17	4	5	26
56	1608210127	Rishabh Chauhan	16	16.5	0		17	5	5	27
57	1608210128	Rishav Chaba	18	0	18		18	4	5	27
58	1608210129	Ritik Gupta	0	17.5	19		19	5	5	29

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Theory Subject Marks

Distributed Systems (RCS-701) CS C 7Semester 4th Year

Sno.	Roll No.	Name of Students	Class Test				CT Total (Best of Two)	Attendance (AT)	Tutorial and Assignment (TA)	TOTAL MM : 30
			CT-1	CT-2	CT-3					
1	1608210130	Ritish Varshney	0	14	17		16	4	5	25
2	1608210131	Ritvik Rastogi	18	18	0		18	5	5	28
3	1608210133	S.M.Shanawar	0	20	0		10	4	5	19
4	1608210134	Sachin Singh	0	13	18		16	4	5	25
5	1608210135	Sakshi Agarwal	0	17	19		18	4	5	27
6	1608210136	Sakshi Gaur	19	16	0		18	5	5	28
7	1608210137	Sakshi Saxena	15	15	0		15	5	5	25
8	1608210138	Samarth Goel	12	13	0		13	5	5	23
9	1608210139	Sameeksha Vishnoi	7	0	0	16	12	4	5	21
10	1608210140	Samra Azeem	18	0	19		19	5	5	29
11	1608210141	Sarthak Agarwal	18	17	0		18	5	5	28
12	1608210142	Satyam Agarwal	0	15	16		16	4	5	25
13	1608210143	Saumya Agarwal	12	15	0		14	4	5	23
14	1608210145	Shafaque Naz	0	16	19		18	4	5	27
15	1608210147	Shashank Yadav	0	13	17		15	4	5	24
16	1608210148	Shipra Dhingra	0	16	18		17	4	5	26
17	1608210149	Shivam Srivastva	0	14	15		15	4	5	24
18	1608210150	Shivam Anand	11	15	0		13	4	5	22
19	1608210151	Shivansh Narayan	0	15	15		15	5	5	25
20	1608210152	Shreya Mishra	12	0	17		15	5	5	25
21	1608210153	Shubham	14	15	0		15	5	5	25
22	1608210154	Shubham Bhatt	0	12	14		13	4	5	22
23	1608210155	Shubham Chauhan	12	0	17		15	4	5	24
24	1608210156	Shubham Gupta S/O A.K.G	10	16	0		13	5	5	23
25	1608210157	Shubham Gupta S/O S.K.G	0	0	20		10	4	5	19
26	1608210158	Shubham Kumar	0	0	13	13	13	4	4	21
27	1608210159	Shubham Kumar Chitransh	6	5	16		11	4	5	20
28	1608210160	Subham Kumar Singh	0	0	0	19	10	4	5	19
29	1608210161	Shubham Sharma	6	0	13		10	5	5	20
30	1608210162	Shubhi Jain	19	15	0		17	4	5	26
31	1608210163	Sonali Saxena	0	18	18		18	4	5	27
32	1608210164	Km Sonam Sehrawat	0	12	16		14	4	5	23
33	1608210165	Soumya Goel	16	15	0		16	4	5	25
34	1608210167	Sugandh Sisodia	16	0	15		16	4	5	25
35	1608210169	Twinkle Rastogi	14	14	0		14	5	5	24
36	1608210170	Udita Bansal	15	17	0		16	4	5	25
37	1608210171	Utkarsh Saxena	0	0	14	16	15	4	4	23
38	1608210172	Utkarsh Mishra	10	0	17		14	4	5	23
39	1608210173	Vaibhav Kumar	0	12	17		15	4	5	24
40	1608210174	Vaishnavi Raman Dwivedi	0	18	19		19	4	5	28
41	1608210175	Vansh Gupta	0	0	11	11	11	4	4	19
42	1608210176	Vardaan Shukla	0	17	0		9	5	5	19
43	1608210177	Varun Kumar Tomar	16	0	19		18	5	5	28
44	1608210178	Vedant Saxena	11	16	0		14	5	5	24
45	1608210180	Vikalp Saxena	7	0	16		12	5	4	21
46	1608210181	Vikash Kumar	0	12	13		13	5	5	23
47	1608210182	Vishal	3	12	17		15	5	5	25
48	1608210183	Vishal Bhatnagar	0	11	16		14	4	5	23
49	1608210184	Vishal Diwakar	0	0	7	16	12	4	4	20
50	1608210185	Vishal Rawat	0	0	9	14	12	4	4	20
51	1608210186	Vivek Shrestha	0	11	16		14	4	5	23
52	1608210187	Yuvraj Singh Rana	8	0	14		11	4	4	19
53	1508210137	Shubham Saini	0	0	20		10	4	5	19
54	1508210156	Tarun Srivastava	0	0	20		10	4	5	19
55	1508210084	Mohd. Shuaib	0	8	0	14	11	4	4	19
56	1708210902	Hardik Kumar Singh	0	13	17		15	4	5	24
57	1708210903	Kiran	0	12	17		15	4	5	24
58	1708210904	Fiza Khan	11	14	0		13	4	5	22
59	1708210905	Megha Gunjan	14	0	8		11	4	4	19
60	1708210906	Pooja Gola	19	17	0		18	5	5	28

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Moradabad Institute of Technology, Moradabad
Department of Computer Science & Engineering
Practicle Subject Marks

Distributed Systems Lab(RCS-751) CS A 7Semester 4th Year

Sno.	Roll No.	Name of Students	Viva (20M)	Test (10M)	Attendance (AT) (10M)	File (10 M)	Internal assessment(VIVA,	TOTAL MM : 50
1	1608210001	Aarush Gupta					0	0
2	1608210002	Aashish Sharma					0	0
3	1608210003	Abdul Azeem					0	0
4	1608210004	Abhay Vishnoi					0	0
5	1608210005	Abhishek Khatri					0	0
6	1608210006	Abhishek Kumar					0	0
7	1608210007	Abhishek Singh					0	0
8	1608210008	Akanksha Gupta					0	0
9	1608210009	Akansha Bhatnagar					0	0
10	1608210010	Akash Gupta					0	0
11	1608210011	Akash Patel					0	0
12	1608210012	Akshita Sharma					0	0
13	1608210013	Alvina Aslam					0	0
14	1608210014	Aman Choudhary					0	0
15	1608210015	Aman Dhariwal					0	0
16	1608210016	Aman Singh S/O J S					0	0
17	1608210017	Aman Singh S/O U S					0	0
18	1608210018	Anannya Saxena					0	0
19	1608210019	Anirudh Chauhan S/O Ps					0	0
20	1608210020	Anirudh Chauhan S/O Skac					0	0
21	1608210021	Ankit Agarwal					0	0
22	1608210022	Ankit Kumar	16	10	9	10	36	45
23	1608210023	Ankit Verma	19	10	10	10	39	49
24	1608210024	Ankita Saxena	16	9	9	10	35	44
25	1608210025	Anmol Arora	16	9	8	8	33	41
26	1608210026	Anmol Vaish	14	9	9	10	33	42
27	1608210027	Anshika Raj	16	9	8	10	35	43
28	1608210028	Anshul Yadav	20	9	9	10	39	48
29	1608210029	Antra Gupta	18	9	9	10	37	46
30	1608210030	Antriksh Singh	16	9	9	10	35	44
31	1608210031	Anubhav Baliyan	18	9	8	10	37	45
32	1608210032	Anukriti Agarwal	18	10	9	9	37	46
33	1608210033	Anushka Krishnatreya	20	10	8	9	39	47
34	1608210034	Arjun	18	9	10	10	37	47
35	1608210035	Arpit Chauhan	18	9	9	9	36	45
36	1608210036	Arun Kumar Gautam	18	10	10	10	38	48
37	1608210037	Ashi Verma	20	10	9	9	39	48
38	1608210038	Ashish	16	10	9	9	35	44
39	1608210039	Ashish Trivedi	20	10	8	9	39	47
40	1608210040	Ashmit Narayan Rai	19	10	10	10	39	49
41	1608210041	Astha Saxena	16	10	10	10	36	46
42	1608210042	Ayush Gupta	16	10	8	10	36	44
43	1608210043	Ayush Rastogi	16	9	8	8	33	41
44	1608210044	Ayushi Gupta	19	9	10	10	38	48
45	1608210045	Ayushi Mathur	20	9	10	10	39	49
46	1608210046	Ayushi Saxena	19	10	10	10	39	49
47	1608210048	Bharat Bajaj	18	8	8	10	36	44
48	1608210050	Deepansh Saran	16	8	8	9	33	41
49	1608210051	Dev Karan Singh	16	9	10	10	35	45
50	1608210052	Devanshu Agarwal	18	9	8	8	35	43
51	1608210053	Devanshu Varshney	16	10	8	9	35	43
52	1608210054	Dhruv Bhatt	16	9	8	9	34	42
53	1608210055	Diti Gupta	20	9	8	9	38	46
54	1608210056	Divyang Mehrotra	16	9	8	10	35	43
55	1608210057	Falak Mujeeb	20	8	8	10	38	46
56	1608210058	Gaurav Yadav	18	10	8	8	36	44
57	1608210059	Geetanjali Wadhwa	18	10	8	9	37	45
58	1608210060	Gunjan Radhawal	16	8	8	10	34	42
59	1608210061	Hannan Tanveer	18	8	8	9	35	43
60	1608210062	Harsh Choudhary	20	8	8	9	37	45
61	1608210063	Harsh Verma	20	9	8	10	39	47
62	1708210901	Abhiv Kumar Yadav	18	10	8	9	37	45

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Department of Computer Science & Engineering
Practicle Subject Marks

Distributed Systems Lab(RCS-751) CS B 7Semester 4th Year

Sno.	Roll No.	Name of Students	Viva Execution (20M)	Test (10M)	Attendance (10M)	File (10 M)	Internal assessment(VIVA,	TOTAL MM : 50
1	1608210064	Harshita Madhok	18	9	8	8	35	43
2	1608210066	Himanshu Agnihotri	16	10	8	9	35	43
3	1608210068	Hrithik Sisodia	16	10	8	9	35	43
4	1608210069	Isha Sethi	20	9	8	9	38	46
5	1608210070	Jaideep Choudhary	16	9	8	10	35	43
6	1608210071	Juhi Rastogi	16	9	9	10	35	44
7	1608210073	Kshitiz Saxena	20	9	10	9	38	48
8	1608210074	Lalit Gupta	16	9	10	9	34	44
9	1608210075	Manas Munjial	16	9	10	9	34	44
10	1608210076	Manik Agarwal	20	9	9	9	38	47
11	1608210077	Manish Singh Bisht	20	9	10	10	39	49
12	1608210078	Manisha Singh	20	9	9	10	39	48
13	1608210079	Mansi Tyagi	20	10	10	10	40	49
14	1608210080	Milan Vishnoi	20	10	10	10	40	49
15	1608210081	Mohammad Anas	20	10	10	10	40	49
16	1608210082	Mohammad Anzar	14	8	9	9	31	40
17	1608210084	Mohd. Aqdus	20	8	9	8	36	45
18	1608210086	Mohd. Bilal	18	8	8	8	34	42
19	1608210088	Mohd. Tabrez Khan	16	8	9	8	32	41
20	1608210089	Mohd Umar	14	8	9	10	32	41
21	1608210090	Mukti	14	8	9	8	30	40
22	1608210092	Muskan	14	9	9	9	32	41
23	1608210093	Muskan Chaddha	16	10	10	9	35	45
24	1608210094	Muskan Mathur	20	10	10	9	39	49
25	1608210095	Nandni Shishodiya	16	10	10	10	36	46
26	1608210096	Neelendra Kumar	16	9	8	8	33	41
27	1608210097	Neetesh	14	9	10	10	33	43
28	1608210098	Neha Srivastava	16	9	10	10	35	45
29	1608210099	Nidhi Patel	16	9	8	10	35	43
30	1608210100	Nikhil Kumar S/O PK	20	9	10	10	39	49
31	1608210101	Nikhil Kumar S/O RK	16	9	10	10	35	45
32	1608210102	Nimisha	16	8	8	9	33	41
33	1608210103	Nishant Pal	16	9	10	8	33	43
34	1608210104	Nishkarsh Krishan	14	9	10	10	33	43
35	1608210105	Nishtha Varshney	20	9	9	9	38	47
36	1608210106	Nusrat Ali	16	8	8	8	32	40
37	1608210107	Paras Dhawan	20	10	9	8	38	47
38	1608210108	Parth Garg	14	9	9	10	33	42
39	1608210109	Piyush Diwaker	18	8	10	10	36	46
40	1608210110	Piyushi Saraswat	20	9	10	9	38	48
41	1608210111	Prakhar Agarwal	18	9	8	7	34	42
42	1608210112	Prakhar Kumar Gautam	20	9	8	8	37	45
43	1608210113	Prashant Varshney	20	8	10	10	38	48
44	1608210114	Pratham Kr Singh Rathore	18	10	10	9	37	47
45	1608210115	Pratiksha Sahani	19	10	10	10	39	49
46	1608210116	Prerna Arya	18	9	8	8	35	43
47	1608210117	Priyam Tyagi	16	9	10	10	35	45
48	1608210118	Puru Raj Singh	16	8	10	10	34	44
49	1608210119	Rachit Gahlot	18	9	8	8	35	43
50	1608210120	Rajat Diwakar	16	9	8	8	33	41
51	1608210122	Rashi Sharma	18	8	10	8	34	44
52	1608210123	Ravi Kumar Sagar	16	8	8	8	32	40
53	1608210124	Reetika Gupta	16	9	8	8	33	41
54	1608210125	Rishabh Agarwal	16	9	10	8	33	43
55	1608210126	Rishabh Chandok	16	9	8	8	33	41
56	1608210127	Rishabh Chauhan	18	9	10	8	35	45
57	1608210128	Rishav Chaba	18	8	10	8	34	44
58	1608210129	Ritik Gupta	19	10	10	10	39	49

Dr. Somesh Kumar
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Moradabad Institute of Technology, Moradabad
Department of Computer Science & Engineering
Practicle Subject Marks

Distributed Systems Lab(RCS-751) CS B 7Semester 4th Year

Sno.	Roll No.	Name of Students	Viva (20M)	Test (10M)	Attendance (10M)	File (10 M)	Internal assessment(VIVA,	TOTAL MM : 50
1	1608210130	Ritish Varshney	20	10	8	9	39	47
2	1608210131	Ritvik Rastogi	20	10	8	9	39	47
3	1608210133	S.M.Shanawar	16	9	8	8	33	41
4	1608210134	Sachin Singh	16	9	9	10	35	44
5	1608210135	Sakshi Agarwal	20	10	9	10	40	49
6	1608210136	Sakshi Gaur	18	9	8	9	36	44
7	1608210137	Sakshi Saxena	18	9	8	9	36	44
8	1608210138	Samarth Goel	18	10	8	9	37	45
9	1608210139	Sameeksha Vishnoi	18	9	8	9	36	44
10	1608210140	Samra Azeem	20	10	8	10	40	48
11	1608210141	Sarthak Agarwal	20	9	8	10	39	47
12	1608210142	Satyam Agarwal	20	10	8	9	39	47
13	1608210143	Saumya Agarwal	16	10	8	9	35	43
14	1608210145	Shafaque Naz	20	10	8	10	40	48
15	1608210147	Shashank Yadav	16	10	8	9	35	43
16	1608210148	Shipra Dhingra	18	9	8	9	36	44
x	1608210149	Shivam Srivastva	16	8	8	10	34	42
18	1608210150	Shivam Anand	16	8	8	10	34	42
19	1608210151	Shivansh Narayan	16	9	8	10	35	43
20	1608210152	Shreya Mishra	20	10	8	10	40	48
21	1608210153	Shubham	18	8	8	10	36	44

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CO Attainment and Analysis

Direct CO Attainment using Continuous Internal Examination (CIE)

Course Code	CO	CO Attained (% of students getting ≥ 60% marks)	CO Attained (On Scale of 3)
RCS701	CO1	100	3
	CO2	100	3
	CO3	100	3
	CO4	100	3
	CO5	100	3

Direct CO Attainment using Semester End Examination (SEE)

Course Code	CO	CO Attained (% of students getting ≥ 60% marks)	CO Attained (On Scale of 3)
RCS701	CO1	52.54	1.58
	CO2	52.54	1.58
	CO3	52.54	1.58
	CO4	52.54	1.58
	CO5	52.54	1.58

Direct CO Attainment (CO_Direct)

Course Code	CO	CO Attained Using CIE (CO_CIE)	CO Attained using SEE (CO_SEE)	Direct CO Attainment (CO_Direct = 0.3*CO_CIE + 0.7*CO_SEE)	Direct CO Attainment (On Scale of 3)
RCS701	CO1	100	52.54	66.78	2
	CO2	100	52.54	66.78	2
	CO3	100	52.54	66.78	2
	CO4	100	52.54	66.78	2
	CO5	100	52.54	66.78	2

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Indirect CO Attainment (CO_Indirect)

Course Code	CO	Indirect CO Attainment (CO_Indirect)	Indirect CO Attainment (On scale of 3)
RCS701	CO1	95.76	2.87
	CO2	98.31	2.95
	CO3	96.61	2.9
	CO4	97.46	2.92
	CO5	97.46	2.92

CO Attainment

Course Code	CO	Direct CO Attainment (CO_Direct)	Indirect CO Attainment (CO_Indirect)	CO Attainment (CO = 0.9*CO_Direct + 0.1*CO_Indirect)	CO Attainment (On scale of 3)	Y/N
RCS701	CO1	66.78	95.76	69.68	2.09	Y
	CO2	66.78	98.31	69.93	2.1	Y
	CO3	66.78	96.61	69.76	2.09	Y
	CO4	66.78	97.46	69.85	2.1	Y
	CO5	66.78	97.46	69.85	2.1	Y

Course Code	CO	CO Targets	CO Attainment	Y/N
RCS701	CO1	65	69.68	Y
	CO2	65	69.93	Y
	CO3	65	69.76	Y
	CO4	65	69.85	Y
	CO5	65	69.85	Y

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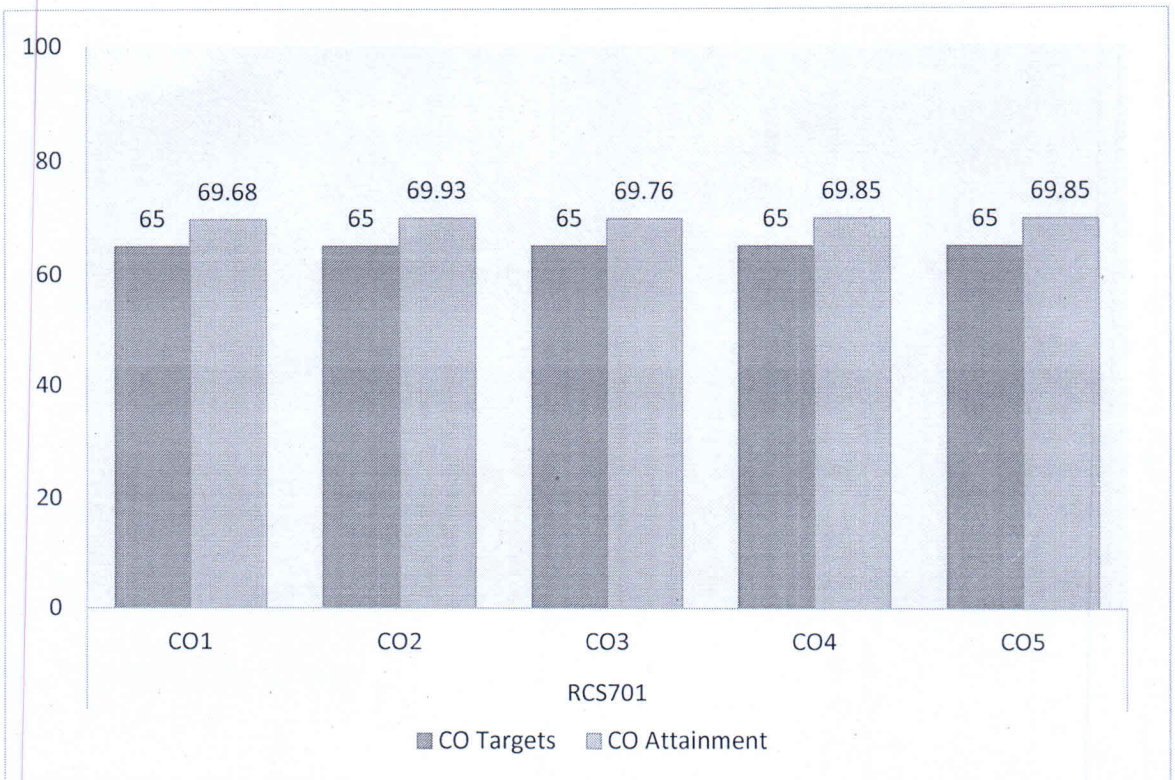

Closure of Quality Loop

Course Code	CO	CO Targets	CO Attainment Gap	Action proposed to bridge the gap where targets are not achieved	Modification of targets where Achieved
RCS701	CO1	65	-4.68		Target is increased to 66%
	CO2	65	-4.93		Target is increased to 67%
	CO3	65	-4.76		Target is increased to 67%
	CO4	65	-4.85		Target is increased to 67%
	CO5	65	-4.85		Target is increased to 67%

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