

**MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY**

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**University Examinations 2015/2016**

THIRD YEAR, FIRST SEMESTER EXAMINATION FOR BACHELOR OF SCIENCE IN COMPUTER TECHNOLOGY AND BACHELOR OF SCIENCE INFORMATION TECHNOLOGY

**CIC 3328: PARALLEL AND DISTRIBUTED SYSTEMS**

**DATE: NOVEMBER, 2015 TIME:** $2$ **HOURS**

**INSTRUCTIONS:** *Answer question* ***one COMPULSORY*** *and any other* ***two*** *questions.*

**QUESTION ONE – (30 MARKS)**

1. Describe any three types of failure in distributed system. (3 Marks)
2. Compare and contrast:
3. The three mutual exclusion algorithms key properties (6 Marks)
4. Parallel and distributed systems (4 Marks)
5. Explain Client-centric Consistency Model. (3 Marks)
6. Explain push-based and pull-based protocols. (4 Marks)
7. Describe any three strategies of handling deadlock. (6 Marks)
8. Explain two types of failures. (2 Marks)
9. Describe RMI principles. (2 Marks)

**QUESTION TWO (20 MARKS)**

1. Distinguish between the following terms in the context of parallel and distributed systems.
2. Starvation and deadlock (2 Marks)
3. Dependability and availability (2 Marks)
4. “Shared and write locks” as used in concurrency control. (2 Marks)
5. Explain any three challenges inherent in Parallel and distributed systems. (6 Marks)
6. Discuss the principles of a token bucket algorithm. (4 Marks)
7. Describe the data store model. (2 Marks)
8. Explain Byzantine failures. (2 Marks)

**QUESTION THREE (20 MARKS)**

1. Discuss the following distributed algorithms. (9 Marks)
2. Distributed
3. Centralized
4. Cristian
5. Describe properties of distributed transactions. (8 Marks)
6. Describe how concurrency transaction problems are addressed in distributed system?

 (3 Marks)

**QUESTION FOUR (20 MARKS)**

1. Describe the three main components of a distributed file service. (6 Marks)
2. Explain how distributed file system security is achieved. (6 Marks)
3. Explain the purpose of middleware. (3 Marks)
4. Discuss the following:
5. Multicomputer (1 Marks)
6. Concept of Replication (1 Mark)
7. Scaling techniques (3 Marks)

**QUESTION FIVE (20 MARKS)**

1. Explain distributed commit concept. (3 Marks)
2. Distributed file system typically provides three types of services. Each can be thought of as a component of a distributed file system. State and explain each of these services.(3 Marks)
3. Briefly explain four features of a good distributed file system. (4 Marks)
4. Enumerate and discuss four types of transparencies in distributed system. (6 Marks)
5. Explain the following security threats concepts: (4 Marks)
6. Interception
7. Interruption
8. Modification
9. Fabrication