



PIONEER INTERNATIONAL UNIVERSITY

Powered by Intellect, Driven by Values.

UNIVERSITY EXAMINATIONS

ACADEMIC YEAR: 2021/2022

SEMESTER: JAN-APRIL 2022

CODE:BSIT 3110

UNIT: DISTRIBUTED SYSTEMS

DATE: APRIL 2022

TIME: 2 HOURS

SPECIAL

INSTRUCTIONS: Answer question one and any other two

SECTION A: Compulsory.

1.

a) Define distributed system giving examples

2 Marks

b. Distinguish between the following terms in the context of distributed systems

i. Starvation and deadlock. [2mks]

ii. Shared and write locks. [2mks]

iii. Clock skew and Clock drift. [2mks]

c. What are the main choices to be considered in design of RMI? [4 Marks]

d. What is meant by the following terminologies in distributed systems. **6 Marks**

i. Concurrency control?

ii. File replication

iii. Directory services?

e. i. Differentiate between RPC and RMI

6 Marks

ii. Explain the steps taken when an RPC is invoked

6 Marks

2)

a)

i) Differentiate with relevant examples the difference between external clock synchronization and internal synchronization **2mks**

ii) Explain why two or more computers that are internally synchronized are not necessarily externally synchronized **2mks**

b). Define failure masking and explain the techniques for achieving failure masking **4 Marks**

c) Outline the major causes of changes in a directory service

6Marks

d) Analyze the life time of a stream socket

6Marks

3)

a) Lamport devised a synchronization mechanism based on the “happened before” relation. Explain the happened before relation assumptions **5mks**

b) A distributed file system is supposed to exhibit some basic symptoms. Expound on these symptoms **5mks**

c) Examine the different categories of faults giving one example in each **4mks**

d. Uncontrolled interleaving of concurrent transactions can lead to three main types of problems. Explain the Three concurrency problems and provide a solution to each **6 Marks**

4. a) Describe three strategies used to increase scalability in distributed systems. Give and explain specific examples of each. **6 Marks**

b) Describe any Four types of transparency **4 Marks**

c) Discuss why you think it is necessary to implement a distributed system **5 Marks**

d) Expound on any four criteria that should be met by dependable systems **5 Marks**

