Semester: 5th
Subject Name:- DOS & Code:- CS30009
Branch (s): CSE

AUTUMN **MID SEMESTER EXAMINATION-2024**

School of Computer Engineering
Kalinga Institute of Industrial Technology, Deemed to be University
Distributed Operating System
[CS30009]

Time: 1 1/2 Hours **Full Mark: 20**

Answer Any four questions including question No.1 which is compulsory.
The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable and all parts of a question should be answered at one place only.

1. Answer all the questions. [1 Mark X 5]
   a) Designing a multicomputer system is relatively easier than a multiprocessor system. (True/False). Justify your statement.
   b) Why is avoiding centralized components crucial for scalability in distributed systems?
   c) Differentiate between tightly coupled systems and loosely coupled systems.
   d) What issue occurs in a non-blocking receive() primitive. How to fix it?
   e) What is the consequence of a process holding the token, but does not need to enter into the critical section?
2. (a) How does fault tolerance affect the performance and reliability of distributed systems? [2.5 Marks]
   (b) Compare, and contrast between switch-based multiprocessors and switch-based multicomputers with separate examples for each type. [2.5 Marks]
3. (a) What is meant by the Open system? Briefly describe the different layers, interfaces, and protocols of distributed systems. Why the TCP/IP protocol suite is not suitable for distributed systems? [2.5 Marks]
   (b) How to deal with Orphans, while a client crashes during RPC? [2.5 Marks]
4. (a) With a suitable block diagram, explain the unbuffered primitive in detail. What are the problems that occur when the client calls send() primitive before the server calls receive() primitive in an unbuffered message passing mechanism? Explain some strategies to handle these problems [2.5 Marks]
   (b) Discuss the problems and solutions of Cristian's Algorithm used for clock synchronization in distributed systems. [2.5 Marks]
5. (a) How a server can manage multiple client requests simultaneously in a distributed System? Analyze the the major techniques used with their pros and cons. [2.5 Marks]
   (b) Suppose in a centralized approach to mutual exclusion in a distributed system, the coordinator crashes. Does this always bring the system down? If not, under what circumstances does this happen? [2.5 Marks]

*** Best of Luck ***