Sub Code: CST-308 **ROLL NO……..……..**

Ist SEMESTER EXAMINATION, 2022 – 23
Ist Year, M. Tech – Computer Science and Engineering
DISTRIBUTED SYSTEMS

Duration: 3:00 hrs **Max Marks: 100**

Note: - Attempt all questions. All Questions carry equal marks. In case of any ambiguity or missing data, the same may be assumed and state the assumption made in the answer.

Q 1.	Answer any four parts of the following. **a)** Examine the different type of challenges in distributed system. **b)** Define system layers used in operating system. Also explain core OS functionality. **c)** How information is distributed in routing overlay? Point-out the main task perform by routing overlay. **d)** Differentiate between flat and nested distributed transaction. **e)** Write down the requirements of digital signature. Use the concept of public keys explain how digital signature can be used to certify the certain piece of information. **f)** Explain the Chandy-Lamport's global state recording algorithm.	5x4=20
Q 2.	Answer any four parts of the following. **a)** Compare architectural model and fundamental model. **b)** Discuss the optimistic methods for concurrency control. **c)** Define logical clock. Why does a logical clock need to be implemented in distributed systems? **d)** Discuss the role of client and server stub procedures in RPC in the context of procedural languages. **e)** Compare and discuss the relative advantages of X.500 with GNS. **f)** State distributed deadlock. Discuss a distributed approach for deadlock detection using edge chasing algorithm.	5x4=20
Q 3.	Answer any two parts of the following. **a)** Elaborate the main purpose of Distributed object applications in RMI? Discuss the design issues for RMI. **b)** What do you mean by mutual exclusion in distributed system? Enlist the essential requirements of a good mutual exclusion algorithm? Is mutual exclusion problem more complex in distributed system than single computer system? Justify your answer. **c)** Give the design issues in distributed shared memory. State the algorithm for implementation of distributed shared memory.	10x2= 20
Q 4.	Answer any two parts of the following. **a)** Define the main characteristics of distributed file system. Differentiate the responsibilities of various modules of file server architecture. **b)** State agreement protocols? Explain byzantine agreement problem, the consensus problem and interactive consistency problem. Show that byzantine agreement cannot always be reached among four processor if two processors are faulty. **c)** Explain two phase commit protocol used for realizing atomicity in distributed system.	10x2= 20

Q 5.	Answer any two parts of the following. **a)** State Sun Network File System. Discuss how NFS handles the condition when (i) $T - Tc > t$ (ii) $T - Tc = 0$ and (iii) $Tm_{client} = Tm_{server}$. **b)** List out issues and difficulties related to design and implementation of middleware for peer-to-peer system? Suggest solutions to overcome such issues. **c)** Explain the components of the CORBA architecture. Discuss on CORBA security services related to authentication and object methods.	10x2= 20

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