	(OR)					
b.i.	Consider an IoT application remotely manages sensors to acquire the data for the real time monitoring. Suggest the suitable distributed client server-based architecture model which manages the large scale data acquisition system remotely.	8	3	2	3
ii.	Compare reliable and un-reliable primitives with example.	4	3	2	3
30. a.	Consider an application under distributed ring topology with N-stations, (numbered 1 to N) running token ring protocol where the stations are equally spaced. When a station get the token, it is allowed to send one frame of fixed size. The stations are wanted to maintain the mutual exclusion across the network. Propose a suitable algorithm and network structure to maintain mutual exclusion across the stations.	12	3	3	3
	(OR)					
b.	Explain about distributed deadlock detection and recovery mechanism in detail.	12	2	3	1
31. a.	Explain about dynamic load balancing algorithm in detail. List out various design issues related to load balancing algorithm.	12	2	4	1
	(OR)					
b.	Explain the concept of redundancy under the fault tolerance. Discuss with example.	12	2	4	1
32. a.	Demonstrate the concept of object oriented distributed shared process and its communication model under the distributed systems.	12	2	5	1
	(OR)					
b.	Design a real time application for page based distributed shared memory model with suitable example.	12	3	5	2

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Reg. No.														

B.Tech. DEGREE EXAMINATION, MAY 2023
Fifth & Sixth Semester

18CSE356T – DISTRIBUTED OPERATING SYSTEMS
(For the candidates admitted during the academic year 2018-2019 to 2021-2022)

Note:
(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.
(ii) **Part - B & Part - C** should be answered in answer booklet.

Time: 3 hours Max. Marks: 100

		Marks	BL	CO	PO
	PART – A (20 × 1 = 20 Marks) Answer **ALL** Questions				
1.	_____ type of switch requires only N/2 switches to connect N-CPU's with N-memory modules (A) Cross bar switch (B) Omega switch (C) Mesh grid switch (D) Ethernet network switch	1	1	1	3
2.	_____ is an example for distributed systems. (A) Image processing (B) Text message (C) Machine learning (D) ATM machine	1	1	1	1
3.	Which statement is not correct about multicomputer systems? (A) Multicomputer are message-passing machines (B) Global address space for memory and process can access shared memory (C) Packet switching method to exchange data (D) Distributes memory with MIMD architectures	1	2	1	2
4.	Bitcoin is an example for following system M-DEL. (A) Centralized distributed model (B) Decentralized distributed model (C) Centralized cloud resource model (D) Server client architecture model	1	1	1	1
5.	Asynchronous transfer mode (ATM) supports _____ type of transmission. (A) Connectionless, long and fixed size packet (B) Connection oriented, short and fixed size packet (C) Circuit switched based long and fixed size packet only (D) Client server based short and fixed size packet only	1	1	2	1
6.	_____ type of process remains suspended and does not return control until a message has actually been received. (A) Send-blocking primitives (B) Receive-blocking primitives (C) Send-nonblocking primitives (D) Receive-nonblocking primitives	1	2	2	2
7.	Select the application which is not related to RPC mechanism under distributed systems. (A) Virtual reality application (B) Google drive application (C) Remote graphics application (D) Cloud computer application	1	1	2	1

8. Which statement is not true about UDP protocol? 1 2 2 2
   (A) Does not require prior communication setup
   (B) Unreliable protocol
   (C) Handshaking dialogues to establish connection
   (D) Provides integrity verification through checksum

9. Indefinite postponement of a process because it requires some resources, but the resource is never allocated to this process. 1 2 3 2
   (A) Wait for graph (WFG)
   (B) Live lock
   (C) Mutual exclusion
   (D) Clock synchronization

10. The approximate time taken by the server, when reply is received at the client's node, its clock is readjusted to _____ under the passive time server, with time 'I', and propagation message time 'T'. 1 2 3 2
   (A) $(T_1 - T_0 - I)/2$
   (B) $T + (T_1 - T_0 - I)/2$
   (C) $T_1 - T_0$
   (D) $T_1 + T_0$

11. Logical clocks implemented as a part of _____ algorithm. 1 1 3 1
   (A) Token ring algorithm
   (B) Election algorithm
   (C) Bully algorithm
   (D) Lamport algorithm

12. The total requirement of message length under the bully algorithm _____. 1 2 3 2
   (A) 2(N–1) messages
   (B) (N–2) messages
   (C) (N–1) messages
   (D) N messages

13. _____ is not an example for real time distributed systems. 1 1 4 1
   (A) Telephone and cellular networks
   (B) Cloud computing systems
   (C) Intelligent highways systems
   (D) Convolution neural networks.

14. The mean response time of the processor pool with 'λ' input rate and 'μ' process rate. 1 2 4 2
   (A) $T = 1/(n\mu - n\lambda)$
   (B) $T = T/n$
   (C) $T = 1/(\mu - \lambda)$
   (D) $T = n/2(\mu - \lambda)$

15. Which statement not true about the thread level implementation in distributed OS? 1 2 4 2
   (A) Handle signals, such as keyboard interrupts
   (B) Producer-consumer problems easy to implement
   (C) If a thread page fault occur, will not block entire process
   (D) Threads run in a single address space, on different CPU's

16. Which is not a state of cache block? 1 1 4 1
   (A) Valid
   (B) Invalid
   (C) Clean
   (D) Dirty

17. In _____ type of multiprocessor, if the two CPU's try to access the same memory simultaneously, one of them will have to wait. 1 2 5 2
   (A) Bus based multiprocessor
   (B) Crossbar switch based multiprocessor

   (C) Ring based multiprocessor
   (D) Numa based multiprocessor

18. _____ is not a type of fault tolerance in distributed systems. 1 1 5 1
   (A) Transient
   (B) Intermittent
   (C) Permanent
   (D) Exclusive

19. Which is not true about object oriented distributed systems? 1 2 5 2
   (A) It is more modular than other techniques
   (B) More flexible implementation through control access
   (C) Synchronization and access can be integrated
   (D) It can run old dusty deck multiprocessor programs

20. _____ is an example for real-time applications and time critical applications. 1 1 5 1
   (A) Object based distributed systems
   (B) Numa memory access
   (C) Page based memory access
   (D) Cross bar switched multiprocessor

PART – B (5 × 4 = 20 Marks) Marks BL CO PO
Answer **ANY FIVE** Questions

21. What are the advantages of distributed system over centralized isolated PC's? 4 2 1 1

22. How to relate the concept of Google drive application as a real time example for distributed system implementation? Justify. 4 3 1 2

23. Draw the ATM layer header structure and discuss about it's features. 4 1 2 1

24. Compare buffered and unbuffered primitives with example. 4 1 2 1

25. List out various synchronization mechanism used under the distributed system. 4 1 3 1

26. Explain the concept of bidding algorithm with real time example. 4 1 4 1

27. Differentiate strict and release consistency model. 4 1 5 1

PART – C (5 × 12 = 60 Marks) Marks BL CO PO
Answer **ALL** Questions

28. a. Consider an application multiplayer web-based game which operates based on distributed system model. List out various design issues need to be considered during the implementation of this application. 12 3 1 3

(OR)

   b. Explain structure level difference between the network operating system with multiprocessor time sharing distributed systems. 12 2 1 2

29. a. Explain about ATM network structure and its reference model in detail. 12 2 2 2