B.Tech. DEGREE EXAMINATION, MAY 2022
Fifth & Sixth Semester

18CSE356T – DISTRIBUTED OPERATING SYSTEMS
(For the candidates admitted from the academic year 2018-2019 to 2019-2020)

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** should be answered in answer booklet.

Time: 2½ Hours   Max. Marks: 75

PART – A (25 × 1 = 25 Marks)
Answer ALL Questions

	Marks	BL	CO	PO

1. How many copies of the operating system are there in a distributed system having "n" machines?   (1, 1, 1, 1,6,9,10,12)
   (A) n/2   (B) 1
   (C) n   (D) n/3

2. In _____ type of kernel, both user services are kept in separate address space.   (1, 1, 1, 1,6,9,10,12)
   (A) Nanokernel   (B) Exokernel
   (C) Microkernel   (D) Monolithic kernel

3. In the architecture for grid computing systems, _____ layer deals with handling access to multiple resources and typically consists of services for resource discovery.   (1, 1, 1, 1,6,9,10,12)
   (A) Connectivity layer   (B) Collective layer
   (C) Resource layer   (D) Application layer

4. A design consisting of snoopy write through cache is _____ and _____ to the programmer.   (1, 2, 1, 1,6,9,10,12)
   (A) Coherent and visible   (B) Coherent and invisible
   (C) Incoherent and visible   (D) Incoherent and invisible

5. In a true distributed system, the user cannot tell where the hardware and software resources are called as   (1, 2, 1, 1,6,9,10,12)
   (A) Replication transparency   (B) Concurrency transparency
   (C) Location transparency   (D) Migration transparency

6. In OSI model, these layers are responsible for host to host layers?   (1, 1, 2, 1,6,9,10,12)
   (A) Physical, datalink, network and transport
   (B) Datalink, network, transport and session
   (C) Transport, session, presentation and application
   (D) Network, transport, session and presentation

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25. _____ consistency refers that if a write happens to a variable X with value 1, then read happens to read the variable only with the updated value   (1, 1, 5, 1,6,9,10,12)
    (A) Sequential   (B) Release
    (C) PRAM   (D) Strict

PART – B (5 × 10 = 50 Marks)
Answer ALL Questions

	Marks	BL	CO	PO

26. a. Explain in your own words the concept of transparency in distributed system.   (10, 3, 1, 1,6,9,10,12)

(OR)

b. What are the main difference between a distributed operating system and network operating system, briefly elaborate?   (10, 3, 1, 1,6,9,10,12)

27. a. Illustrate with neat diagram the concepts of RPC and steps involved.   (10, 4, 2, 1,6,9,10,12)

(OR)

b. Write note on primitives   (3, 2, 1,6,9,10,12)
   (i)   Buffered Vs unbuffered   (5)
   (ii) Reliable Vs unreliable   (5)

28. a. Elaborate the algorithms for electing a coordinator in distributed system.   (10, 3, 3, 1,6,9,10,12)

(OR)

b. Explain in detail about the strategies used to handle deadlock in distributed system.   (10, 3, 3, 1,6,9,10,12)

29. a. Discuss about design issues for processor allocation algorithms.   (10, 3, 4, 1,6,9,10,12)

(OR)

b. Explain in detail on, "A system is said to fail, when it does not meet its specification" – fault tolerance.   (10, 3, 4, 1,6,9,10,12)

30. a. Write in detail on consistency model   (4, 5, 1,6,9,10,12)
   (i)   Strict consistency   (5)
   (ii) Weak consistency   (5)

(OR)

b. Write a note on Amoeba servers.   (10, 3, 5, 1,6,9,10,12)

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7. Identify the two fundamental modes of inter-process communication   1   2   2   1,6,9, 10,12
    (I)   Shared memory   (II)   Message passing
    (III)   Independent   (IV)   Co-operating
    (A)   I and II   (B)   II and III
    (C)   III and IV   (D)   I and IV

8. Head-of-line blocking mechanism occurs in   1   1   2   1,6,9, 10,12
    (A)   ATM networks   (B)   Layered protocol
    (C)   Client-server model   (D)   Remote procedure calls

9. In dynamic binding, the input call register follows the sequence of   1   2   2   1,6,9, 10,12
    (A)   Name, version, handle, unique   (B)   Name, version, handle id
    (C)   Name, version, unique id   (D)   Name, version

10. When the server crashes in RPC, the recovery procedure depends entirely on _____ technique and guarantees that the RPC has to be carried out   1   2   2   1,6,9, 10,12
    (A)   Atleast once semantics   (B)   Atmost once semantics
    (C)   Exactly once semantics   (D)   Not possible to recover

11. In passive time server centralized algorithm, when the replay is received at the client node, its clock is readjusted to   1   2   3   1,6,9, 10,12
    (A) $T_1 + (T_1 - T_0)/2$ (B) $T_0 + (T_2 - T_1)/2$
    (C) $T_2 + (T_1 - T_0)/2$ (D) $T + (T_1 - T_0)/2$

12. Using the token – passing approach if a process wants to enter into a critical section, the maximum waiting time or the maximum number of message transfer happens in the network   1   2   3   1,6,9, 10,12
    (A)   n   (B)   n–1
    (C)   n+1   (D)   2n

13. In a distributed system, there may be unpredictable variation in the message propagation time between two nodes. Choose from the following, which algorithm are given below address this issue   1   2   3   1,6,9, 10,12
    (A)   Cristian, Berkley, Global averaging   (B)   Cristian, Local averaging, Global averaging
    (C)   Barkley, Local averaging, Global averaging   (D)   Cristian, Barkely, Local averaging

14. Drift rate is approximately _____, giving a difference of 1 second every 1, 000, 000 seconds or _____ days.   1   2   3   1,6,9, 10,12
    (A) 10^6, 11.5 days   (B) 10^6, 11.6 days
    (C) 10^6, 10.5 days   (D) 10^6, 10.6 days

15. Which of the given statement is true regarding deadlock prevention and avoidance schemes?   1   2   3   1,6,9, 10,12
    (A)   Deadlock prevention is less restrictive than deadlock avoidance
    (B)   In a deadlock prevention, the request for resources are always granted, if the resulting state is safe
    (C)   In deadlock, avoidance does not require knowledge of resource requirements a priori
    (D)   In deadlock avoidance, the request for resources is always granted, if the resulting state is safe

16. A processor pool, which can be dynamically allocated to users on demand, considering input rate as "$n\lambda$" and the process rate as "$n\mu$". The mean response time will be   1   2   4   1,6,9, 10,12
    (A) $T_1 = 1/(n\mu - n\lambda)$ (B) $T_0 = 1/(n\mu + n\lambda)$
    (C) $T_1 = 1/(n\mu + n\lambda)$ (D) $T_1 = 1/(n\mu * n\lambda)$

17. What happens, if a client sends a request to a server to do some work and crashes before the server replies? This unwanted computation is called as   1   1   4   1,6,9, 10,12
    (A)   A log entry   (B)   An orphan
    (C)   Grand parent   (D)   Blast protocol

18. Receiver – initiated distributed heuristic algorithm takes the disadvantage of   1   2   4   1,6,9, 10,12
    (A)   Do not put extra load on the system at critical time
    (B)   When the system is heavily loaded, the chance of a machine having insufficient work is small
    (C)   Creates considerable proble traffic as all the unemployed machines desperately hunt for work
    (D)   Do not create proble traffic as all the unemployed machines desperately hunt for work

19. The preferred model to run a simulation project or a big AI program is   1   1   4   1,6,9, 10,12
    (A)   Client – server model   (B)   Workstation model
    (C)   Processor –pool model   (D)   Hybrid model

20. One possible goal of processor allocation is to maximize the number of CPU cycles actually executed on behalf of user jobs per hour real time. This is referred as   1   1   4   1,6,9, 10,12
    (A)   CPU allocation   (B)   CPU utilization
    (C)   CPU execution time   (D)   CPU computing power

21. To keep atleast two CPUs from attempting to get to the memory simultaneously, some sort of _____ is required.   1   1   5   1,6,9, 10,12
    (A)   Bus selection   (B)   Bus master election
    (C)   Bus arbitration   (D)   Coordinator selection

22. The MEMNET block table consists of   1   1   5   1,6,9, 10,12
    (A)   Valid, exclusive, home, interrupt, location bits   (B)   Valid, cached, dirty, location bits
    (C)   Valid, uncached, dirty, interrupt, location bit   (D)   Valid, dirty, exclusive, location bits

23. If event A is influenced by an earlier event A_0, represents   1   2   5   1,6,9, 10,12
    (A)   Strict consistency   (B)   Casual consistency
    (C)   Weak consistency   (D)   PRAM consistency

24. The write once protocol supports the following three states   1   2   5   1,6,9, 10,12
    (A)   Valid, unclean, dirty   (B)   Invalid, uncached, dirty
    (C)   Invalid, clean, dirty   (D)   Uncached, clean, dirty