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B.Tech DEGREE EXAMINATION, DECEMBER 2023

Fifth to Seventh Semester

18CSE356T - DISTRIBUTED OPERATING SYSTEMS

(For the candidates admitted during the academic year 2020 - 2021 & 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** and **Part - C** should be answered in answer booklet.

Time: 3 Hours **Max. Marks: 100**

PART - A (20 × 1 = 20 Marks) Marks BL CO

Answer **all** Questions

1. In _____ type of kernel, both user services and kernel services are kept in separate address space. 1 1 1
   (A) Microkernel (B) Monolithic kernel
   (C) Nanokernal (D) Exokernal

2. In a bus-based multiprocessor, whenever a word is written to the cache, it is written to memory as well. This policy is known as _____ 1 1 1
   (A) Write back (B) Write around
   (C) Write through (D) Write immediate

3. Caching and replication leads to _____ 1 2 1
   (A) Consistency problems (B) Decreases the availability of components
   (C) Helps to balance the load between components (D) Hide the communication latency problem

4. True distributed system supports_____ 1 1 1
   (A) Loosely coupled hardware and loosely coupled software (B) Tightly coupled hardware and loosely coupled software
   (C) Tightly coupled hardware and tightly coupled software (D) Loosely coupled hardware and tightly coupled software

5. The required resources for communication between end systems are reserved for the duration of the session between end systems in _____ method. 1 1 2
   (A) Packet switching (B) Circuit switching
   (C) Line switching (D) Frequency switching

6. User datagram protocol is called connectionless because _____ 1 1 2
   (A) All UDP packets are treated independently by transport layer (B) It sends data as a stream of related packets
   (C) It is received in the same order as sent order (D) It sends data very quickly

7. Virtual circuit identifier in frame relay is called _____ 1 1 2
   (A) Data link connection identifier (B) Frame relay identifier
   (C) Cell relay identifier (D) Circuit connection identifier

8. Message passing provides a mechanism to allow processes to communicate and to synchronize their actions by _____ 1 1 2
   (A) Without sharing the same address space (B) By sharing the same address space
   (C) By sharing the same process identifier (D) By sharing the same process number

9. Data structure maintained by operating system to maintain information for each thread within a process is known as _____ 1 1 3

(A) Thread package (B) Thread control block
(C) Symbol table (D) Process Control block

10. Which of the following is not a basic requirement of Mutual Exclusion Algorithms 1 1 3

(A) Safety property (B) Liveness property
(C) System throughput (D) Fairness

11. Berkely's and Christian's clock synchronization methods are type of _____. 1 1 3

(A) Scalar clock synchronization method (B) Vector clock synchronization method
(C) Logical clock synchronization method (D) Physical clock Synchronization method

12. Difference in precision between a reference clock and a physical clock is known as_____ 1 1 3

(A) Clock drift rate (B) Drift
(C) Skew (D) Clock synchronization

13. The purpose of a registry-based algorithm is used in the workstations are for 1 1 4

(A) Finding the process (B) Deregister files
(C) Finding and using idle workstation (D) Scheduler activations

14. In which technique, processes are reassigned at the runtime depending upon the situation that is the load will be transferred from heavily loaded nodes to the lightly loaded nodes? 1 1 4

(A) Task assignment (B) Static load balancing
(C) Dynamic load balancing (D) Hybrid technique.

15. In the processor allocation strategies, a process can be moved even if it has already started execution 1 1 4

(A) Sender Initiated (B) Optimal allocation algorithm
(C) Non-migratory allocation algorithm (D) Migratory allocation algorithm

16. In which Priority assignment policy for Load-balancing algorithms, local processes are given higher priority than remote processes 1 1 4

(A) Selfish (B) Altruistic
(C) Intermediate (D) Distributed

17. In _____ all processes see only those memory reference operations in the correct order that are potentially causally related 1 1 5

(A) Continuous Consistency (B) Sequential Consistency
(C) Eventual Consistency (D) Causal Consistency

18. In _____a single address space is divided into a private part and a shared part. 1 1 5

(A) Munin (B) Memnet
(C) LAN (D) WAN

19. In page-based DSM too large page size in Granularity introduces a disadvantage called_____ 1 1 5

(A) False page (B) Page fault
(C) False sharing (D) Page sharing

20. To access or operate on the internal state of an object, the programs have to _____. 1 1 5

(A) Invoke the process (B) Call the process
(C) Call the variables (D) Invoke the methods

PART - B (5 × 4 = 20 Marks) Marks BL CO

Answer **any 5** Questions

21. Differentiate multiprocessor and multicomputer. Explain their types. 4 2 1

22.	Brief about the original objective of the OSI model which provides the set of design standards for equipment manufacturers to support system-to-system communication.	4	2	2
23.	Explore the Happened Before relation with an illustrative example.	4	2	3
24.	With suitable examples, write about the three types of faults.	4	2	4
25.	A multiprocessor has a single bus. Is it possible to implement strictly consistent memory?	4	2	5
26.	Illustrate about the blocking and nonblocking primitives in client-server model with examples.	4	2	2
27.	Why is the concept of "home memory" needed in Memnet but not in Dash?	4	2	5

PART - C (5 × 12 = 60 Marks)

Answer **all** Questions

		Marks	BL	CO
28.	(a) How do the fundamental hardware concepts employed in distributed operating systems contribute specifically to their overall functionality and efficiency? Provide detailed examples with necessary diagrams to illustrate their impact on system performance.	12	4	1
	(OR)			
	(b) What are the specific design issues encountered in distributed operating systems, and how do these issues impact the overall performance and functionality of such systems? Analyze the interconnections between these issues and their implications on system design and operation.			
29.	(a) Discuss in detail about the ATM Reference Model. State and prove that ATM networks are connection-oriented networks for cell relay that supports voice, video and data communications.	12	2	2
	(OR)			
	(b) Describe the principles underlying RPC, demonstrating a clear comprehension of how it enables remote execution of procedures. Discuss the flow of RPC calls and the basic steps involved in its functioning.			
30.	(a) Examine the fundamental concept of election algorithms in distributed systems. Explore the various types of election algorithms, elucidating their unique characteristics and the specific criteria that define each type with neat diagrams.	12	2	3
	(OR)			
	(b) Illustrate with suitable example the four possible ways for preventing deadlock.			
31.	(a) Analyze the design issues related to processor allocation algorithms. Explore about various Processor Allocation Algorithms.	12	4	4
	(OR)			
	(b) What is Real time distributed Systems? Elaborate on the scheduling choices available in the context of real-time distributed systems.			
32.	(a) Memory Consistency models are contract between the software and the memory. Why is such a contract needed? Write about Strict and Casual Consistency model with example.	12	2	5
	(OR)			
	(b) Explain the software architecture of AMOEBA, comprising the microkernel and the ensemble of servers responsible for delivering operating system functionalities.			

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