KUMARAGURU
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Register Number:………….…

M.E DEGREE EXAMINATIONS: MAY 2018

(Regulation 2015)

Second Semester

COMPUTER SCIENCE AND ENGINEERING

P15CST202: Parallel and Distributed Systems

<u>**COURSE OUTCOMES**</u>

CO1: Apply parallel program design techniques

CO2: Explain how to access remote objects

CO3: Understand how to work in the distributed environment

CO4: Explain synchronization of distributed events using common global clocks

CO5: Outline the issues involved in distributed transactions

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Assertion (A): Monolithic and Microkernel are the key examples of kernel design   CO4   [K_2]

    Reason (R): Monolithic and Microkernel design differ primarily in the decision as to

    what functionality belongs in the kernel and what is to be left to server processes that

    can be dynamically loaded to run on top of it

    a)   Both A and R are Individually true and   b)   Both A and R are Individually true but
          R is the correct explanation of A   R is not the correct explanation of A

    c)   A is true but R is false   d)   A is false but R is true

2. Which of the following is not a component of file service?   CO3   [K_2]

    a)   Flat file service   b)   Client module

    c)   Directory service   d)   Server module

3. Which of the following characteristics of the network are hidden by the TCP stream   CO3   [K_2]
    abstraction?

    i. Message sizes

    ii. Lost messages

    iii. Flow control

    iv. Error control

    v. Message blocking

a) i, ii, iii   b) i, ii, iii, v

c) ii, iv, v   d) i, ii, iv

4. Match the items in List 1 with the items in List II   CO4   [K_2]

List I	List II
A. Happened-before relation	i. Berkeley algorithm
B. Chandy and Lamport	ii. synchronizing clocks
C. Gusella and Zatti	iii. potential causal ordering
D. Cristian	iv. snapshot algorithm

	A	B	C	D
a)	iv	iii	i	ii
b)	iii	iv	i	ii
c)	iv	iii	ii	i
d)	iii	iv	ii	i

5. Assertion (A): Mobile computing is the performance of computing tasks while the user   CO2   [K_2]
is on the move

Reason (R): In mobile computing, users who are away from their 'home' intranet are
still provided with access to resources via the devices they carry with them

a) Both A and R are Individually true and R   b) Both A and R are Individually true but
is the correct explanation of A   R is not the correct explanation of A

c) A is true but R is false   d) A is false but R is true

6. The --------- model is characterized by a dynamic mapping of tasks onto processes for   CO1   [K_2]
load balancing in which any task may potentially be performed by any process

a) Work Pool   b) Master-Slave

c) Task Graph   d) Data-Parallel

7. --------- is (are) the issue(s) relating to datagram communication   CO2   [K_2]

1. Message size   3. Blocking

2. Timeouts   4. Receive from any

a) 1,3,4   b) 1,2,3,4

c) 1,2,3   d) 2,3,4

8. --------------- decomposition is used when a program may take one of many possible   CO1   [K_2]
computationally significant branches depending on the output of other computations
that precede it

a) Recursive	b) Exploratory		
c) Hybrid	d) Speculative		

9. ---------- parameter is not of primary interest when it comes to processing and transporting multimedia streams — CO5 [K$_2$]

a) Bandwidth	b) Latency		
c) Loss rate	d) Scaling		

10. Under active replication, the sequence of events when a client requests an operation to be performed is — CO5 [K$_2$]

    1. Request   2. Agreement   3. Response   4. Coordination   5. Execution

a) 1-2-3-4-5	b) 1-5-4-2-3		
c) 1-4-5-2-3	d) 1-4-5-3-2		

PART B (10 x 2 = 20 Marks)

11.	Compare fine-grained and coarse-grained granularity	CO1	[K$_2$]
12.	Give an example for Hybrid decomposition	CO1	[K$_2$]
13.	What are thin clients?	CO2	[K$_2$]
14.	Compare synchronous and asynchronous distributed systems	CO2	[K$_2$]
15.	Compare marshalling and unmarshalling of data	CO3	[K$_2$]
16.	Name the participants in distributed event notification	CO3	[K$_2$]
17.	What do you mean by Copy-on-write?	CO4	[K$_2$]
18.	Compare external and internal synchronization of clocks	CO4	[K$_2$]
19.	What do you mean by video-on-demand services?	CO5	[K$_2$]
20.	What are the main tasks of a group membership service?	CO5	[K$_2$]

PART C (6 x 5 = 30 Marks)

21.	Describe about the Blocking buffered send/receive mechanism	CO1	[K$_2$]
22.	Explain any one fundamental model of distributed systems briefly	CO2	[K$_2$]
23.	List down the distributed file system requirements	CO3	[K$_2$]
24.	Compare Monolithic kernel and Microkernel	CO4	[K$_2$]
25.	Compare Flat and Nested transactions with an example	CO5	[K$_2$]
26.	Describe about the various characteristics of the tasks that have influence on the suitability of a mapping scheme	CO1	[K$_2$]

Answer any FOUR Questions
PART D (4 x 10 = 40 Marks)

27. (i) List down the challenges faced in the design of distributed systems.   (3)   CO2   [K$_2$]

   (ii) Prepare a multicast program using JAVA APIs where TCP is used for connection establishment, and UDP for data transfer among a group of 10users.Priority should be allotted to any user who communicates within 3 minutes of getting connected. Assign a clock to check if a user joins the group, and remove users who do not communicate within 3 minutes of joining.   (7)   CO2   [K$_3$]

28. Illustrate the design issues and implementation of RMI   (10)   CO3   [K$_2$]

29. (i) Write and explain the Ricart and Agrawala's algorithm for implementing mutual exclusion with an example compare it with maekawa voting algorithm.   (8)   CO4   [K$_2$]

   (ii) Name the core OS components.   (2)   CO4   [K$_2$]

30. What do you mean by phantom dead lock? Describe about the edge-chasing algorithm for distributed deadlock detection.   (10)   CO5   [K$_2$]

31. Describe about Data decomposition with examples.   (10)   CO1   [K$_2$]

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