

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2018

Course: Distributed Computing (CSIB 489)

Semester: VII

Programme: B.Tech_CSE Spz BFSI/CCVT/BAO/ECOMRA/IT/ITSCF/MT/TI/OSS&OS/GG/MI

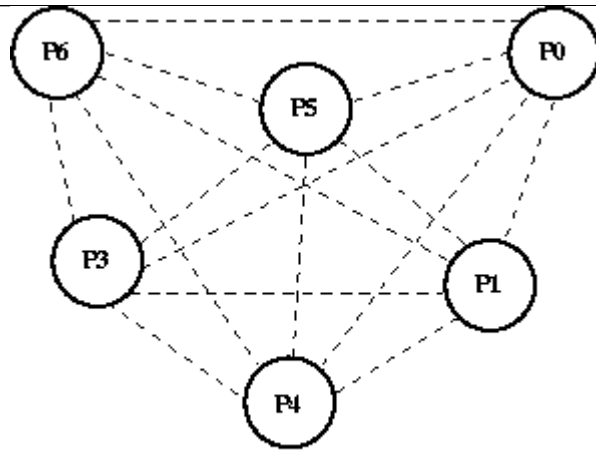
Time: 03 hrs.

Max. Marks: 100

Instructions: Attempt all the questions. Internal choice is given in Question Nos 9, 10 and 12.

SECTION A

S. No.		Marks	CO
Q 1	What are the key differences between distributed and centralized computing paradigms?	4	CO1
Q 2	Explain message-oriented communication. Why do distributed systems not have shared memory?	4	CO2
Q 3	How is clock synchronization done in distributed systems? What are the different types of clocks?	4	CO3
Q 4	Explain load balancing approach with a suitable example. Why load balancing is required?	4	CO4
Q 5	Explain ACID properties in context of distributed database system.	4	CO5
SECTION B			
Q 6	Explain any 5 types of transparencies in distributed systems. How is distributed system different from parallel system?	8	CO1
Q 7	Why is inter-process communication needed in a distributed environment? What are different approaches of IPC?	8	CO2
Q 8	What is an election algorithm? Apply <i>Bully Algorithm</i> on the below mentioned problem when leader node 6 becomes non-responsive. Explain the steps of election of next leader.	8	CO3



Q 9	<p>Why and what knowledge of the node is important in load balancing? What are the issues if knowledge estimated is not correct?</p> <p style="text-align: center;">OR</p> <p>What are the performance parameters of a load-balancing algorithm? Explain location policy of stable symmetrically initiated approach.</p>	8	CO4
Q 10	<p>How does Service Oriented Architecture (SOA) relate with distributed systems? What are the benefits of SOA?</p> <p style="text-align: center;">OR</p> <p>What are the key elements of grid computing? Analyze the drawbacks of a grid system and suggest possible remedies.</p>	8	CO5
SECTION-C			
Q 11	<p>What do you mean by RPC? Design a basic RPC system and explain its working. Define stub module. What are the issues for inter-process communication in distributed environment?</p>	20	CO2
Q 12	<p>Explain process synchronization. How is deadlock handling done in distributed computing environment? Consider an OR resource request model and Wait for Graph (WFG), $G = \{V, E\}$, where $V = \{P1, P2, P3\}$ and $E = \{<P1, P2>, <P2, P3>, <P3, P1>\}$. Is the system in deadlock state? Justify.</p> <p style="text-align: center;">OR</p> <p>Why global clock is important in distributed system? Why this is an issue and how can it be resolved? Consider a bank database, which is fully replicated. Give an algorithm / protocol for ordering the transactions in above situation.</p>	20	CO3

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Instructions: Attempt all the questions. Internal choice is given in Question Nos 9, 10 and 12.

SECTION A

S. No.		Marks	CO
Q 1	What are the characteristics of a distributed system? How these systems are different from centralized systems?	4	CO1
Q 2	What is RMI? How does an RMI system work?	4	CO2
Q 3	What are the logical clocks? List the issues related to global states.	4	CO3
Q 4	Write short note on process migration. What are the components of process management?	4	CO4
Q 5	How are Durability and Consistency implemented in distributed environment?	4	CO5

SECTION B

Q 6	What are the design goals for distributed systems? Explain types and working of MIMD systems.	8	CO1
Q 7	What do you mean by RPC? Design a basic RPC system and explain its working.	8	CO2
Q 8	What do you understand by mutual exclusion? List and briefly explain election algorithms.	8	CO3
Q 9	What is load balancing? What are the characteristics of <i>above average algorithm</i> ? How the system load is estimated in <i>above average algorithm</i> ? OR What are the performance parameters of a load-balancing algorithm? Explain location policy of stable symmetrically initiated approach.	8	CO4
Q 10	Explain Service Oriented Architecture (SOA) with a suitable example? What are the key benefits of SOA? OR What are the key elements of grid computing? Analyze the drawback of a grid system and suggest possible remedies.	8	CO5

SECTION-C

Q 11	How is message passing done in DS? How are events and notifications handled in this scenario? What is the use of stub in RPC?	20	CO2
Q 12	What are various clock synchronization strategies? What are the key considerations for it? Give 5 modern examples of distributed systems. OR Why global clock is important in distributed system? How is deadlock handling done	20	CO3

in distributed computing environment? Consider an OR resource request model and Wait for Graph (WFG), $G = \{V, E\}$, where $V = \{K1, K2, K3\}$ and $E = \{<K1, K2>, <K2, K3>, <K3, K1>\}$. Is the system in deadlock state? Justify your answer.		
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