Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2018

CS3EL04/IT3EL04 Distributed Systems

Programme: B.Tech. Branch/Specialisation: CSE/IT

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. The example of distributed systems is **1**

(a) Internet (b) Intranet

(c) Both Internet and Intranet (d) None of these

ii. If one site falls in distributed system **1**

(a) The remaining sites can continue operating

(b) All the sites will stop working

(c) Directly connected sites will stop working

(d) None of these

iii. An RPC (remote procedure call) is initiated by **1**

(a) Server (b) Client

(c) Both Server and Client (d) Neither Server nor Client

iv. The local operating system on the server machine passes the incoming packets to the **1**

(a) Server stub (b) Client stub

(c) Client operating system (d) None of these

v. In distributed systems a logical clock is associated with **1**

(a) Each Instruction (b) Each Process

(c) Each Register (d) None of these

vi. In token passing approach of distributed systems to achieve mutual exclusion, processes are organized in a ring structure **1**

(a) Logically (b) Physically

(c) Both logically and physically (d) None of these

vii. In Distributed file system the mapping between the logical and physical object is called **1**

(a) Client Interfacing (b) Naming (c) Migration (d) Heterogeneity

P.T.O.

viii. Which of the following is a visual way to determine the deadlock occurrence? **1**

(a) Resource allocation graph (b) Starvation graph
(c) Inversion graph (d) None of these

ix. A distributed database has which of the following advantages over a centralized database? **1**

(a) Software cost (b) Software complexity
(c) Slow Response (d) Modular growth

x. QoS stands for **1**

(a) Quality of security (b) Quality of system
(c) Quality of service (d) None of these

Q.2 i. Discuss the term 'Heterogeneity' in context to distributed systems. **2**

ii. What is DCE (Distributed Computing Environment)? Enlist its components. **3**

iii. What do you mean by transparency? Define the various transparency types associated with distributed systems. **5**

OR iv. Elaborate the various architectural models of distributed systems. **5**

Q.3 i. Differentiate between a Remote and local method invocation. **2**

ii. Illustrate the RMI invocation semantics. **8**

OR iii. Make use of appropriate diagram and describe the roles of each of the components (objects and modules involved) in a remote method invocation. **8**

Q.4 i. Define clock drift, External synchronization and Internal synchronization. **3**

ii. Describe central server algorithm and ring based algorithm for mutual exclusion. **7**

OR iii. What is the need of election algorithm in distributed system? Describe the ring based election algorithm. **7**

Q.5 i. In context to distributed file system draw and describe the File service architecture. **4**

ii. Draw and brief about the NFS (Network File System) architecture. **6**

OR iii. Explain the two-phase commit protocol in distributed transaction management. **6**

Q.6 Attempt any two:

i. Describe the components of Load Distributing Algorithms. **5**

ii. State and explain the types of Load Distributing Algorithms. **5**

iii. Write in brief about distributed database. **5**

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Marking Scheme

CS3EL04/IT3EL04 Distributed Systems

Q.1	i.	The example of distributed systems is (c) Both Internet and Intranet	**1**
	ii.	If one site fails in distributed system (a) the remaining sites can continue operating	**1**
	iii.	An RPC (remote procedure call) is initiated by (b) client	**1**
	iv.	The local operating system on the server machine passes the incoming packets to the (a) server stub	**1**
	v.	In distributed systems a logical clock is associated with (b) Each Process	**1**
	vi.	In token passing approach of distributed systems, processes are organised in a ring structure (a) Logically	**1**
	vii.	In Distributed file system the mapping between the logical and physical object is called (b) Naming	**1**
	viii.	Which of the following is a visual way to determine the deadlock occurrence? (a) Resource allocation graph	**1**
	ix.	A distributed database has which of the following advantages over a centralized database? (d) Modular growth	**1**
	x.	QoS stands for (c) Quality of service	**1**
Q.2	i.	Discuss the term 'Heterogeneity' in context to distributed systems. Defining heterogeneity - 1 mark Role of Middleware - 1 mark	**2**
	ii.	What is 'Openness'? How can Openness be achieved (give appropriate example)? Defining Openness - 1 mark To specify how Openness can be achieved with example - 2 marks	**3**
	iii.	What do you mean by transparency? Define the various transparency types associated with distributed systems. Defining transparency - 1 mark Defining each transparency type (0.5 mark * 8) - 4 marks	**5**
OR	iv.	Elaborate the various architectural models of distributed systems. 5 architectural models(figure/description) (1 mark * 5) - 5 marks	**5**
Q.3	i.	Differentiate between a Remote and local method invocation. Local method invocation - 1 mark Remote method invocation - 1 mark	**2**
	ii.	Illustrate the RMI invocation semantics. Table showing combination of fault tolerant measures - 2 marks Maybe invocation semantics - 2 marks At-least-once invocation semantics - 2 marks At-most-once semantics - 2 marks	**8**
OR	iii.	Make use of appropriate diagram and describe the roles of each of the components (objects and modules involved) in a remote method invocation. Diagram - 2 marks Communication module - 2 marks Remote reference module - 2 marks Proxy/skeleton/dispatcher/remote object - 2 marks	**8**
Q.4	i.	Define clock drift, External synchronization and Internal synchronization. Defining clock drift - 1 mark Defining external synchronization - 1 mark Defining internal synchronization - 1 mark	**3**
	ii.	Describe central server algorithm and ring based algorithm for mutual exclusion. Describe central server algorithm - 3.5 marks Describe Ring based algorithm - 3.5 marks	**7**
OR	iii.	What is an election? Describe the ring based election algorithm. Defining election - 2 marks Ring based election algorithm - 5 marks	**7**
Q.5	i.	In context to distributed file system draw and describe the File service architecture. File service architecture diagram - 1 mark Use of Client module - 1 mark Use of Directory service - 1 mark Use of Flat file service - 1 mark	**4**
	ii.	Draw and brief about the NFS (Network File System) architecture. NFS architecture diagram - 1 mark Explaining briefly about NFS - 5 marks	**6**
OR	iii.	Explain the two-phase commit protocol. Operations for two phase commit protocol - 2 marks Phase 1 and Phase 2 of the two phase commit protocol - 4 marks	**6**

Q.6 Attempt any two:

i. Describe the components of Load Distributing Algorithms. **5**

Giving name of the components (as below) - 1 mark
Transfer policy - 1 mark
Selection policy - 1 mark
Location policy -1 mark
Information policy - 1 mark

ii. State and explain the types of Load Distributing Algorithms. **5**

Any 5 types - Static/dynamic/Adaptive/Load sharing/Load balancing/Pre-emptive/non-pre-emptive (1 mark * 5) -5 marks

iii. Write in brief about distributed database. **5**

Introduction to distributed database - 5 marks

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