Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examination – June – 2017**

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| **Code :** | **14CS3019** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DISTRIBUTED SYSTEMS** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | Why scalability is considered as an important design issue? State some guiding principles for designing a scalable distributed system (DS). | CO1 | 6 |
| b. | Compare the masking and tolerating techniques which are used to handle failures in DS. | CO1 | 5 |
| c. | Discuss on the variants of client-server architecture used in DS. State the reasons for moving away from fat clients towards thin clients. Where will it be applicable and state some applications? | CO1 | 9 |
| (OR) | | | | |
| 2. | a. | Describe the type of failures that are exhibited by processes and communication channels in DS. | CO1 | 10 |
| b. | Compare the following communication modes:   * Synchronous and asynchronous communication * Transient and persistent communication * Buffering and Non-buffering of messages. | CO2 | 10 |
| 3. | a. | Apply Java API for TCP to establish connection where the client program will repeatedly reads a line of input from the user and sends it to server using TCP message and receives reply from the server. The client sets a timeout on its socket so that it can inform the user when the server does not reply within the timeout period. Write the corresponding server and client programs. | CO2 | 10 |
|  | b. | Justify the purpose of computer clock synchronization in DS. How does Berkley algorithm resolve the drawbacks of Christian algorithm? | CO3 | 10 |
| (OR) | | | | |
| 4. | a. | State the main purpose of RPC. Describe the execution steps of Sun RPC. | CO2 | 10 |
|  | b. | Distinguish between R, RR and RRA exchange protocols. | CO2 | 6 |
|  | c. | Consider a student record with ‘name, class, CGPA’ attributes. How will you marshal the record using CDR representation? | CO2 | 4 |
| 5. | a. | Design a distributed event notification architecture to send notifications to subscribers on events like new technological updates, discount sales and new companies on devices such as CT Scanner, MRI Scanner and X-Ray Machine. Discuss on the roles of participating objects, events, notification, publisher and subscriber. | CO2 | 10 |
|  | b. | Discuss on the service architecture and internal data structures of X.500. How is it different from DNS in searching a name space? | CO3 | 10 |
| (OR) | | | | |
| 6. | a. | List the merits and demerits of peer-to-peer system over client server architecture. Though Napster file sharing system is a peer-to-peer system, it did not succeed. Why? | CO3 | 10 |
|  | b. | What is the underlying principle of ‘routing overlays’? How the routing overlay principle is implemented in Tapestry? | CO3 | 10 |
| 7. | a. | Explain the concept of FIFO, Casual and Total ordering of messages with illustrations. Which ordered multicast mechanism is more preferable? | CO3 | 10 |
|  | b. | Identify the components of file service architecture. What are the responsibilities of each of the components? | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | How the recovery manager will restore the distributed transactions that are involved in two-phase commit protocol? | CO3 | 10 |
|  | b. | An application consists of 3 transactions T1, T2, T3 as defined below:   |  |  |  | | --- | --- | --- | | T1: begin\_transaction  R(x);  R(z);  W(x-5);  W(z+5);  end\_transaction | T2: begin\_transaction  R(z);  W(z-8);  R(y);  W(y+8);  end\_transaction | T3: begin\_transaction  R(x);  W(x+4);  R(y);  W(y-4);  end\_transaction |   Describe how the above mentioned transactions can be executed as flat transaction and nested transaction. State the locking rules for ‘nested transactions’. | CO3 | 10 |
|  | | **Compulsory:** |  |  |
| 9. |  | Write in detail on the responsibilities of Quality of Service Manager and its two main subtasks in handling multimedia applications. | CO3 | 20 |