

Register Number

**Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam – 603 110**

(An Autonomous Institution, Affiliated to Anna University, Chennai)

**Department of Computer Science and Engineering**

**Continuous Assessment Test – I**

**Question Paper**

|   |                                       |       |           |      |                   |         |
|---|---------------------------------------|-------|-----------|------|-------------------|---------|
| Degree & Branch                         | BE & Computer Science and Engineering |       |           |      | Semester          | VII     |
| Subject Code & Name                     | UCS1701- Distributed Systems          |       |           |      | Regulation:       | 2018    |
| Academic Year                           | 2023-2024<br>ODD                      | Batch | 2020-2024 | Date | 05.09.2023        | EN / AN |
| Time: 08:10 - 09:40 A.M<br>(90 Minutes) | Answer All Questions                  |       |           |      | Maximum: 50 Marks |         |

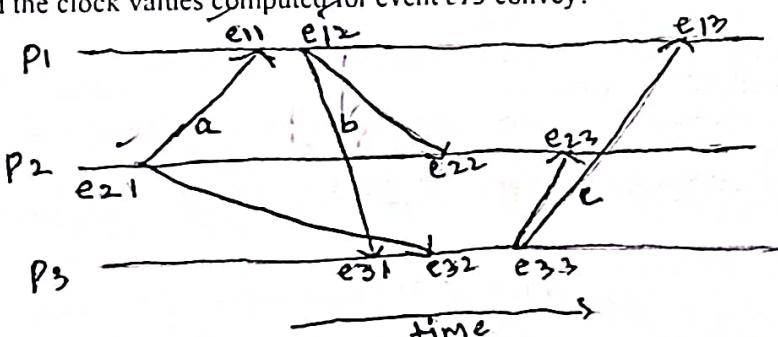
### COURSE OUTCOMES

- CO1- Realize the foundations of Distributed Systems [K2]
- CO2- Able to solve synchronization and state consistency problems [K3]
- CO3- Demonstrate the resource sharing techniques in Distributed systems [K3]
- CO4- Comprehend the working model of consensus and reliability of Distributed Systems [K3]
- CO5- Identify the fundamentals of Peer-to-Peer Systems [K2].
- CO6- Formulate a synchronization problem for an ad-hoc distributed system and adapt its solution [K6]

### Part – A (6×2 = 12 Marks)

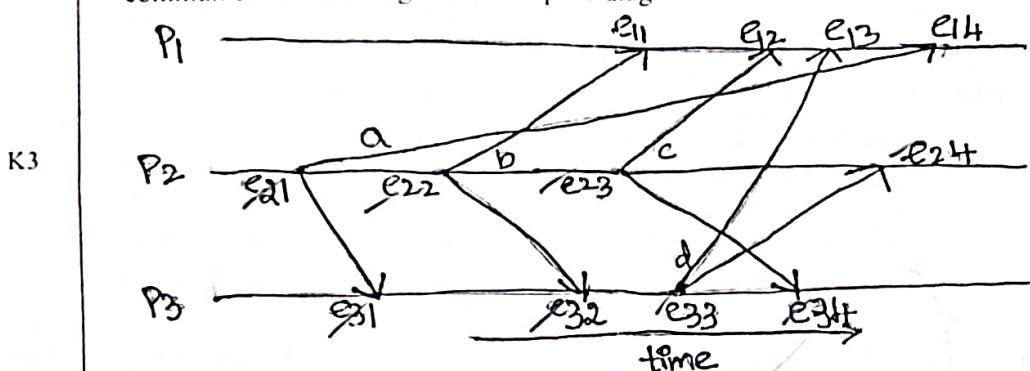
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|----|--|-----|-------|
| K1 | 1. List out various architectures for distributed systems based on Flynn's taxonomy.                               | CO1 | 3.1.1 |
| K2 | 2. Classify the various types of transparencies which hides the implementation policies in the distributed systems | CO1 | 3.1.1 |
| K1 | 3. List the three forms of load balancing  | CO1 | 2.3.2 |
| K2 | 4. Discuss and any two major issues in distributed systems   | CO2 | 2.3.2 |
| K3 | 5. Given two vector timestamps 'ta' and 'tb', how do you identify 'ta < tb'  | CO2 | 1.3.1 |
| K3 | 6. Given two vector timestamps 'ta' and 'tb', does 'ta < tb' always mean 'ta > tb'                                 | CO2 | 1.3.1 |

### Part – B (3×6 = 18 Marks)

|    |  |     |                |
|----|--|-----|----------------|
| K2 | 7. Explain synchronization and coordination mechanisms needed for distributed systems.   | CO1 | 2.2.2          |
| K2 | 8. Outline the strategies designed for achieving the reliable and fault-tolerant distributed systems.  | CO1 | 2.2.2<br>2.3.2 |
| K4 | 9. Consider the following diagram and analyze whether causality property is maintained or violated by computing clock values. Defend your answer. What would the clock values computed for event e13 convey?<br><br> | CO2 | 1.3.1<br>1.4.1 |

**Part – C ( $2 \times 10 = 20$  Marks)**

10. Apply suitable algorithm for the causal ordering of messages in group communication for the given time-space diagram.

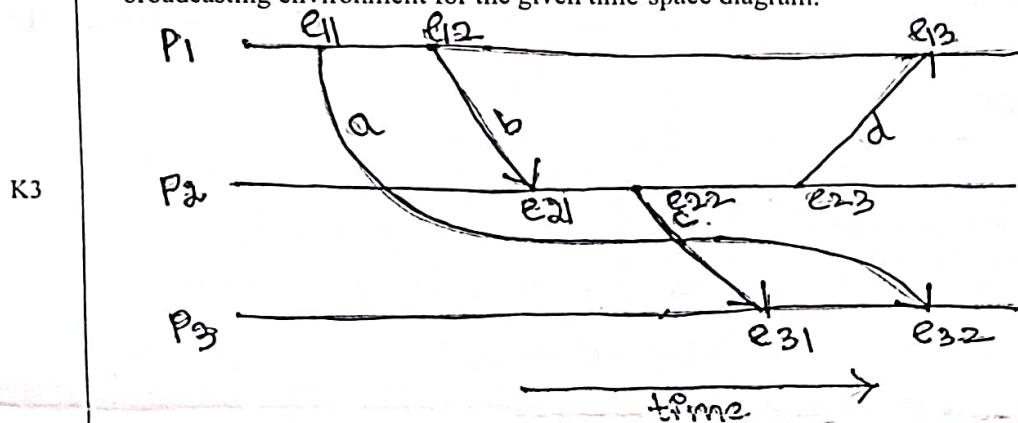


CO2  
1.3.1  
1.4.1

2.3.1

(OR)

11. Apply suitable algorithm for the causal ordering of messages in a non-broadcasting environment for the given time-space diagram.



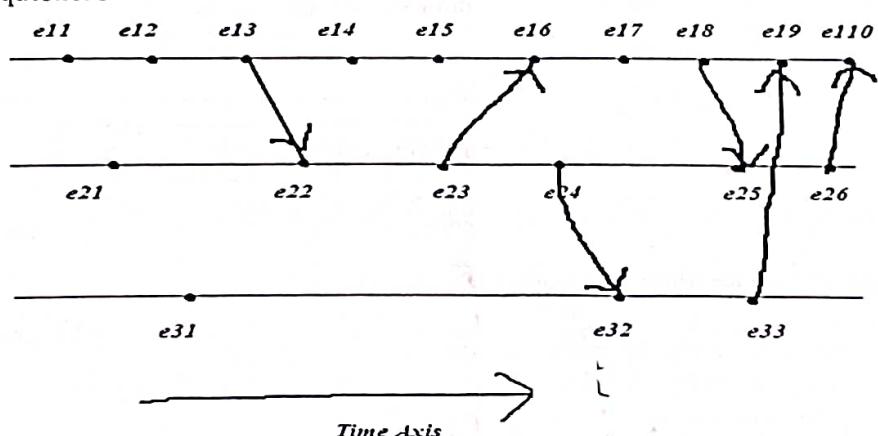
CO2  
1.3.1  
1.4.1  
2.3.1

- K3 12. Consider a suitable example and apply physical clock synchronization technique for the same. Show that physical clock synchronization is not suitable for Distributed systems through your example. Discuss the effects of clock drift and clock skew.

CO2  
1.3.1  
1.4.1  
2.3.1

(OR)

13. Consider the following Time Space diagram and answer the following questions.



CO2  
1.3.1  
1.4.1  
2.3.1

- i. Apply the rules of both Lamport's Logical Clock and Vector clock and compute the values for all the events. [5]  
 ii. Apply the rule for causality and concurrency and show that the limitations of Lamport's clock can be resolved using vector clocks by choosing any appropriate set of events excluding e11, e12, e21 and e31. [5]

----- ALL THE BEST -----

Register Number 

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Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam – 603 110

(An Autonomous Institution, Affiliated to Anna University, Chennai)

Department of Computer Science and Engineering

Continuous Assessment Test – II

Question Paper

|   |                                       |       |           |      |                   |         |
|---|---------------------------------------|-------|-----------|------|-------------------|---------|
| Degree & Branch                         | BE & Computer Science and Engineering |       |           |      | Semester          | VII     |
| Subject Code & Name                     | UCS1701- Distributed Systems          |       |           |      | Regulation:       | 2018    |
| Academic Year                           | 2023-2024<br>ODD                      | Batch | 2020-2024 | Date | 11.10.2023        | FN / AN |
| Time: 08:10 - 09:40 A.M<br>(90 Minutes) | Answer All Questions                  |       |           |      | Maximum: 50 Marks |         |

#### COURSE OUTCOMES

- CO1- Realize the foundations of Distributed Systems [K2]
- CO2- Able to solve synchronization and state consistency problems [K3]
- CO3- Demonstrate the resource sharing techniques in Distributed systems [K3]
- CO4- Comprehend the working model of consensus and reliability of Distributed Systems [K3]
- CO5- Identify the fundamentals of Peer-to-Peer Systems [K2].
- CO6- Formulate a synchronization problem for an ad-hoc distributed system and adapt its solution [K6]

#### Part – A (6×2 = 12 Marks)

|    |   |     |       |
|----|---|-----|-------|
| K1 | 1. Define a Cut in global state of distributed system   | CO1 | 3.1.1 |
| K1 | 2. What is a transit message in distributed system?   | CO2 | 3.1.1 |
| K1 | 3. Why does path pushing algorithm detect phantom deadlocks?  | CO3 | 2.3.2 |
| K1 | 4. What is idle token in mutual exclusion problem?  | CO3 | 2.3.2 |
| K2 | 5. Outline the Fairness and Liveness properties in Distributed Mutex algorithms.  | CO3 | 2.3.2 |
| K3 | 6. Identify the number of control messages to be exchanged to achieve one round of mutex in Suzuki Kasaini's token based Distributed Mutex algorithm. | CO3 | 1.4.1 |

#### Part – B (3×6 = 18 Marks)

|    |  |     |                |
|----|--|-----|----------------|
| K2 | 7. What is a global state in distributed system. What are the three types of global states and illustrate three different types of cuts using a space time diagram.  | CO1 | 2.2.3          |
| K3 | 8. Consider Chandy Lamport's Global State Recording Algorithm (GSRA). Identify how GSRA avoids inconsistent snapshot. Illustrate this scenario with an example.  | CO2 | 2.2.2<br>2.3.2 |
| K4 | 9. Considering the non-token based distributed mutex approach, show how Ricart Agrawala's DMutex algorithm is optimal. Inspect your answer with an example by considering 2 processes in a distributed system. | CO3 | 1.3.1<br>1.4.1 |

#### Part – C (2×10 = 20 Marks)

|    |   |     |                         |
|----|---|-----|-------------------------|
| K3 | 10. Apply the Lampert's non-token based distributed mutual exclusion algorithm for the scenario in which the order of request for critical section is as follows.<br><br>$P_2 \rightarrow (P_2    P_3) \rightarrow P_1 \rightarrow P_3$ .<br>Note: $\parallel$ Represents concurrent request to CS.<br>→ Represents the sequential request to CS. | CO3 | 1.3.1<br>1.4.1<br>2.3.1 |
|----|---|-----|-------------------------|

|    |  |     |                         |
|----|--|-----|-------------------------|
|    | (OR)   |     |                         |
| K3 | <p>11. Apply the token based distributed mutual exclusion algorithm for the scenario in which the order of request for critical section is as follows.</p> $P1 \rightarrow (P3 \parallel P2 \parallel P1) \rightarrow (P1 \parallel P3)$ <p>Note: Initially the token is held by process P3</p> <p>   Represents concurrent request to CS.<br/>Represents the sequential request to CS</p> | CO3 | 1.3.1<br>1.4.1<br>2.3.1 |
| K3 | <p>12. Apply Chandy Misra Haas Algorithm with AND resource model for the given scenario and identify the presence of deadlocks. Does this algorithm detect any phantom deadlocks? Interpret your answer.</p>   | CO3 | 1.3.1<br>1.4.1<br>2.3.1 |
| K3 | <p>13. Apply Chandy Misra Haas Algorithm for OR resource model and demonstrate the process of distributed deadlock detection with an appropriate example.</p>  | CO3 | 1.3.1<br>1.4.1<br>2.3.1 |

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Department of Computer Science and Engineering

Continuous Assessment Test - III

Question Paper

|   |                              |       |           |      |                   |       |
|---|------------------------------|-------|-----------|------|-------------------|-------|
| Degree & Branch                         | BE - CSE                     |       |           |      | Semester          | 7     |
| Subject Code & Name                     | UCS1701- Distributed Systems |       |           |      | Regulation:       | 2018  |
| Academic Year                           | 2023-2024<br>ODD             | Batch | 2020-2024 | Date | 03.11.2023        | FN AN |
| Time: 08:10 - 09:40 a.m<br>(90 Minutes) | Answer All Questions         |       |           |      | Maximum: 50 Marks |       |

**Part – A (6×2 = 12 Marks)**

|    |  |     |                |
|----|--|-----|----------------|
| K2 | 1. If the source is faulty, outline the effect of consensus.       | CO4 | 1.4.1<br>2.2.3 |
| K1 | 2. Define Orphan Messages in distributed systems.                  | CO4 | 2.2.3          |
| K1 | 3. What is the difference between a P2P and Client Server system.  | CO5 | 1.4.1<br>2.2.3 |
| K1 | 4. Define the term Overlay Networks.                               | CO  | 1.4.1<br>2.2.3 |
| K1 | 5. Mention any two applications of P2P systems.                    | CO5 | 2.1.1          |
| K1 | 6. What is local indexing and in which type of overlay it is used? | CO5 | 2.1.1          |

**Part – B (3×6 = 18 Marks)**

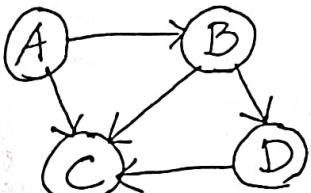
|    |  |     |                          |
|----|--|-----|--------------------------|
| K3 | 7. Consider a Distributed System with three processes. Apply Asynchronous Recovery Algorithm for the occurrence of a crash at Process 2. | CO4 | 1.4.1<br>2.2.3<br>13.2.1 |
| K2 | 8. Discuss Distributed indexing of P2P systems in detail.  | CO5 | 1.4.1                    |
| K2 | 9. Explain Lamport's Bakery Algorithm with a suitable example.   | CO5 | 1.4.1<br>2.1.1           |

**Part – C (2×10 = 20 Marks)**

|    |  |     |                          |
|----|--|-----|--------------------------|
| K3 | 10. Apply synchronous checkpointing algorithm for the given scenario in which D initiates the algorithm. | CO4 | 1.4.1<br>2.2.3<br>13.2.1 |
|    |  |     |                          |

(OR)

11. Consider the following topology,

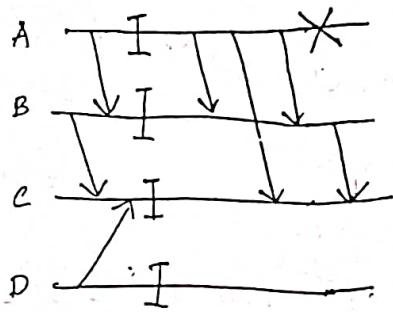


K3

Apply synchronous Recovery algorithm for the given scenario.

CO4

1.4  
2.2  
13.



K3

12. Apply Byzantine consensus for a distributed System with 4 processes including the source. Discuss the effect of Byzantine Agreement for an Asynchronous distributed systems

CO4

1.  
2.  
13.

(OR)

K3

13. Construct a Live locks scenario for two given processes A & B. Simulate 3 three cycles of rollbacks due to live locks.

CO4

1.  
2.  
13.

~~abpt - dat { y | last(x) and (y) } , > + }~~

$|x, y| \geq ls(y) \times > \perp$

{  
num(i) = max(L) + 1  
on  
while [ num(i) <= ls(p) ] ;  
num(i) = num(i) + 1  
}



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Computer Science and Engineering

Continuous Assessment Test – II

Question Paper

|                                       |  |       |           |      |                   |      |
|---------------------------------------|--|-------|-----------|------|-------------------|------|
| Degree & Branch                       | B.E – Computer Science and Engineering |       |           |      | Semester          | VII  |
| Subject Code & Name                   | UCS1702- MOBILE COMPUTING              |       |           |      | Regulation        | 2018 |
| Academic Year                         | 2023-2024<br>ODD                       | Batch | 2020-2024 | Date | 12.10.2023        | FN   |
| Time: 08:10- 09:40 AM<br>(90 Minutes) | Answer All Questions                   |       |           |      | Maximum: 50 Marks |      |

(K1: Remembering, K2: Understanding, K3: Applying, K4 :Analyzing, K5: Evaluating)

Course Outcomes:

|     |  |
|-----|--|
| CO1 | Identify the functionalities of various MAC protocols (K3).                              |
| CO2 | Explain the functionalities of mobile network layer and routing in Ad hoc networks (K3). |
| CO3 | Analyse the transport and application layer protocols (K3).                              |
| CO4 | Explain the basics of mobile telecommunication system (K2).                              |
| CO5 | Develop a mobile application (K3).   |

#### Part – A (6×2 = 12 Marks)

|    |  |     |       |
|----|--|-----|-------|
| K2 | 1. Compare proactive and reactive routing protocols.   | CO2 | 2.2.4 |
| K2 | 2. Explain the concept of "routing overhead" in MANETs, and why is it a concern?   | CO2 | 1.1.2 |
| K2 | 3. What is the role of a foreign agent in TCP snooping? Outline a foreign agent intercept and analyze TCP traffic between a client and server. | CO3 | 2.2.2 |
| K2 | 4. Explain how WDP service is performed.   | CO3 | 1.4.1 |
| K1 | 5. Draw and show how WTLS establishes a secure session.  | CO3 | 1.1.2 |
| K1 | 6. Draw and show how WSP/B over WTP - method invocation happens.   | CO3 | 2.2.2 |

#### Part – B (3×6 = 18 Marks)

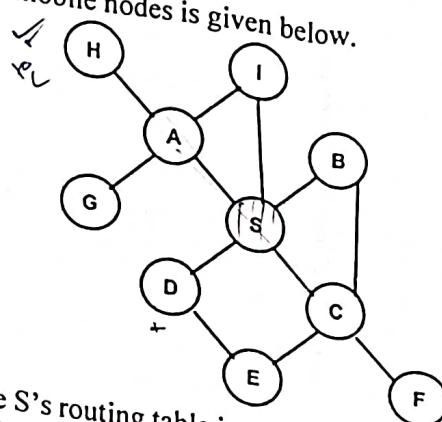
|    |  |     |       |
|----|--|-----|-------|
| K2 | 7. Summarize the primary design challenges in MANETs. How do they differ from traditional wired networks?  | CO2 | 2.2.2 |
| K2 | 8. Compare TCP Tahoe, Reno, and New Reno.  | CO3 | 2.2.4 |
| K3 | 9. One global goal of Wireless application environment is to minimize over-the-air traffic and resource consumption on the hand-held device. Utilize the WAE logical model to verify this statement. | CO3 | 2.2.2 |

#### Part – C (2×10 = 20 Marks)

|    |   |     |                |
|----|---|-----|----------------|
| K4 | Consider the following routing table for mobile node S in an infrastructure less network. | CO2 | 1.1.2<br>1.4.1 |
|----|---|-----|----------------|

| Destination | Next Hop | Hop Count |
|-------------|----------|-----------|
| A           | A        | 1         |
| B           | B        | 1         |
| C           | C        | 1         |
| D           | D        | 1         |
| E           | D        | 1         |
| F           | C        | 2         |
| G           | A        | 2         |
| H           | A        | 2         |
| I           | I        | 1         |

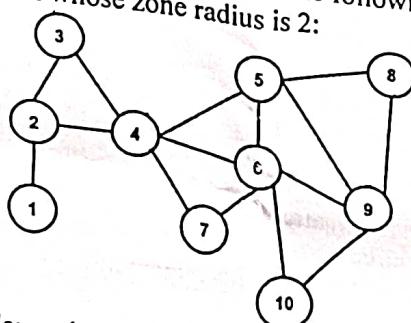
The snapshot of mobile nodes is given below.



The mobile node S's routing table is updated by a proactive routing protocol after node D is disconnected from the network. Analyze the scenario and rebuild S's updated routing table. [Assume no other nodes move in that time interval]. Also, inspect the scenario where node H needs to communicate to node C regularly, but no other nodes communicate among themselves. How would you modify the routing protocol? Suggest any other considerations which would impact the choice of protocol to use?

(OR)

11. Imagine a group of drones deployed for search and rescue operations in a disaster-stricken area. These drones need to communicate and coordinate their efforts efficiently to locate survivors and report their findings to a central command. Consider the following scenario of drone deployment position whose zone radius is 2:



K4

Drone 2 is the sender and drone 8 is the receiver. Inspect the scenario and discover the path from 2 to 8. While discovering the path, analyze and write what happens inside and outside the zone of drone 2. Now, assume another scenario in which drone 2 is sender and drones 7, 8, 9 are receivers of a group communication. Examine why mobile routing protocol of the above scenario is not suitable. Suggest a more appropriate protocol for group communication, justifying its principles and advantages.

CO2

1  
1  
2  
1

|      |   |     |
|------|---|-----|
| K4   | 12. Show and explain the working of Indirect-TCP. Draw the packet flow from a fixed host to a mobile host via a foreign agent. List down the actions of the mobile node and the foreign agents during a handover.   | CO  |
| (OR) |   |     |
| K4   | 13. Imagine you are designing a mobile banking application that allows users to check their account balances, make transfers, and pay bills using their smartphones. The application needs to ensure secure and reliable communication between the user's device and the bank's server over a wireless network. You decide to implement the Wireless Transaction Protocol (WTP) to achieve this. Analyze the scenario and describe the transaction model used in WTP. How does it ensure reliable communication in wireless networks, and how can this benefit your mobile banking application? | CO3 |

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Computer Science and Engineering  
Continuous Assessment Test – III  
Question Paper

|                                       |  |       |           |      |                   |      |
|---------------------------------------|--|-------|-----------|------|-------------------|------|
| Degree & Branch                       | B.E – Computer Science and Engineering |       |           |      | Semester          | VII  |
| Subject Code & Name                   | UCS1702- MOBILE COMPUTING              |       |           |      | Regulation        | 2018 |
| Academic Year                         | 2023-2024<br>ODD                       | Batch | 2020-2024 | Date | 06.11.2023        | FN   |
| Time: 08:10- 09:40 AM<br>(90 Minutes) | Answer All Questions                   |       |           |      | Maximum: 50 Marks |      |

(K1: Remembering, K2: Understanding, K3: Applying, K4 :Analyzing, K5: Evaluating)

Course Outcomes:

|     |  |
|-----|--|
| CO1 | Identify the functionalities of various MAC protocols (K3).                              |
| CO2 | Explain the functionalities of mobile network layer and routing in Ad hoc networks (K3). |
| CO3 | Analyse the transport and application layer protocols (K3).                              |
| CO4 | Explain the basics of mobile telecommunication system (K2).                              |
| CO5 | Develop a mobile application (K3).   |

Part – A (6×2 = 12 Marks)

|    |  |     |       |
|----|--|-----|-------|
| K2 | ✓ Summarize the limitations of GSM.  | CO4 | 1.4.1 |
| K3 | 2. A GSM subscriber travels abroad. The subscriber needs to make a phone call to his son who lives in his home country. Select a teleservice he would use to make the phone call. Name few other teleservices offered to the subscriber. | CO4 | 1.1.2 |
| K2 | 3. Illustrate Mobile originated call.  | CO4 | 2.2.2 |
| K1 | 4. Define Mobile OS.   | CO5 | 1.4.1 |
| K1 | 5. List the benefits of using a layered architecture.  | CO5 | 1.4.1 |
| K1 | 6. What is Android SDK?  | CO5 | 1.4.1 |

Part – B (3×6 = 18 Marks)

|    |  |     |       |
|----|--|-----|-------|
| K3 | 7. A person makes a call from his wired telephone to his friend who uses a mobile phone. Choose the call type of GSM and explain with a neat diagram.  | CO4 | 2.2.2 |
| K3 | 8. Consider a scenario where you are the chief security officer of a major telecommunications company that operates a GSM network. Your network covers a vast area, providing mobile communication services to millions of users. Security is a top priority to protect user data and the integrity of your network. Identify the security services provided by GSM and illustrate these services with a suitable diagram. | CO4 | 2.2.4 |

|    |  |     |      |
|----|--|-----|------|
| K2 | 9. Summarize the role and significance of the Linux kernel in the Android architecture. How does it interact with higher-level Android components? | CO5 | 2.2. |
|----|--|-----|------|

**Part - C ( $2 \times 10 = 20$  Marks)**

|      |   |     |      |
|------|---|-----|------|
| K2   | 10. What are the different components of the Global System for Mobile Communications (GSM) architecture? Explain the components with a neat diagram.  | CO4 | 2.2. |
| (OR) |   |     |      |
| K2   | 11. Describe the architecture and components of GPRS with a neat diagram.   | CO4 | 2.2. |
| K3   | 12. An iOS developer develops an application that allows users to take and share photos. Your application needs to be able to access the camera to take photos, access the photo library to save and share photos, and access the network to share photos with other users. Identify the layers of iOS Architecture involved in developing this application and explain them with a neat diagram. | CO5 | 1.4. |
| (OR) |   |     |      |
| K3   | 13. A team develops a multifaceted Android application. Make use of the primary building blocks of Android to develop a multifaceted application. Explain how these building blocks will be utilized to create a feature-rich user experience Android application.  | CO5 | 1.4. |

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**Continuous Assessment Test – I**

**Question Paper**

|   |                                 |       |         |      |                   |      |
|---|---------------------------------|-------|---------|------|-------------------|------|
| Degree & Branch                         | B.E CSE                         |       |         |      | Semester          | VII  |
| Subject Code & Name                     | UCS1703 Graphics and Multimedia |       |         |      | Regulation:       | 2018 |
| Academic Year                           | 2023-2024<br>ODD                | Batch | 2020-24 | Date | 07.09.2023        | FN   |
| Time: 08:10 - 09:40 a.m<br>(90 Minutes) | Answer All Questions            |       |         |      | Maximum: 50 Marks |      |

(K1: Remembering, K2: Understanding, K3: Applying, K4: Analyzing, K5: Evaluating)

|     |   |
|-----|---|
| CO1 | Apply the algorithms to manipulate output primitives such as line, circle, ellipse (K3)                                     |
| CO2 | Demonstrate transformations, representations and clipping on 2D objects and map window to viewport transformations (K3)     |
| CO3 | Apply three Dimensional concepts like representations, geometric transformations, and projections (K3)                      |
| CO4 | Understand the working of different illumination and color models used to render an animation scene (K2)                    |
| CO5 | Understand different types of multimedia file formats, compression techniques and design basic 3D Scenes using Blender (K2) |

**Part – A (6×2 = 12 Marks)**

|    |   |     |                                   |
|----|---|-----|-----------------------------------|
| K1 | 1. In which component of the graphics system is the picture definition stored and how?  | CO1 | 1.4.1<br>13.2.1                   |
| K1 | 2. What is persistence in a CRT monitor? How does it affect the refresh rate?   | CO1 | 1.3.1<br>1.4.1                    |
| K3 | 3. DDA line drawing algorithm is applied to plot a line AB from A(1,6) to B (5,9). Find $(x_2, y_2)$ when $(x_1, y_1) = (2,7)$ .  | CO1 | 1.1.1<br>1.4.1<br>2.1.3<br>13.3.1 |
| K2 | 4. Illustrate the 2D graphics pipeline.   | CO2 | 1.4.1                             |
| K3 | 5. Identify the correct answer.<br>Shearing is a transformation that<br>a. distorts but does not move the object<br>b. distorts and may move the object based on the shearing reference line<br>c. moves the object but does not distort the object<br>d. retains the original shape of the object but enlarges or decreases the size<br>Justify your answer by applying shearing on a unit square. | CO2 | 1.4.1<br>2.1.3                    |
| K2 | 6. Compare and contrast Uniform and Differential scaling.   | CO2 | 1.1.1<br>1.4.1<br>2.1.2<br>13.2.1 |

**Part – B (3×6 = 18 Marks)**

|    |   |     |                                   |
|----|---|-----|-----------------------------------|
| K2 | 7. Explain random and raster scan systems. Show using diagrams how basic output primitives are drawn in these systems.  | CO1 | 1.3.1<br>1.4.1<br>13.2.1          |
| K3 | 8. Apply Midpoint circle drawing algorithm to plot the points on the circle with centre = (4,5) and radius = 4. Show how each point $(x_k, y_k)$ is calculated. | CO1 | 1.1.1<br>1.4.1<br>2.1.3<br>13.3.1 |
| K2 | 9. Illustrate the technique of interlacing with suitable diagrams.  | CO1 | 1.3.1<br>1.4.1                    |

**Part – C (2×10 = 20 Marks)**

|      |   |     |  |
|------|---|-----|--|
| K3   | 10. Apply the Bresenham's line drawing algorithm for the given points (2,1) and (10,12). Plot the pixels and draw the line. Show how each point $(x_k, y_k)$ is calculated.             | CO1 | 1.1.1<br>1.4.1<br>2.1.3<br>2.4.1<br>13.3.1 |
| (OR) |   |     |  |
| K3   | 11. Apply the ellipse drawing algorithm to plot points on the ellipse with $r_x = 9$ and $r_y = 7$ . Show how each point $(x_k, y_k)$ is calculated.                                    | CO1 | 1.1.1<br>1.4.1<br>2.1.3<br>2.4.1<br>13.3.1 |
| K3   | 12. a. Rotate a triangle (4,6), (2,2), (6,2) about the vertex (4,6) by 180 degrees counterclockwise and find the new vertex. Use homogeneous co-ordinate representation.                | CO2 | 1.1.1<br>1.4.1<br>2.1.3<br>2.4.1<br>13.3.1 |
| (OR) |   |     |  |
| K3   | 13. Apply reflection on a square with vertices (2,2) (6,2) (2,6) and (6,6) with respect to the line $x = y$ and with reflection factor = 2. Use homogeneous co-ordinate representation. | CO2 | 1.1.1<br>1.4.1<br>2.1.3<br>2.4.1<br>13.3.1 |

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**Department of Computer Science and Engineering**

**Continuous Assessment Test – II**

**Question Paper**

|   |                                 |       |         |      |                   |      |
|---|---------------------------------|-------|---------|------|-------------------|------|
| Degree & Branch                         | B.E CSE                         |       |         |      | Semester          | VII  |
| Subject Code & Name                     | UCS1703 Graphics and Multimedia |       |         |      | Regulation:       | 2018 |
| Academic Year                           | 2023-2024<br>ODD                | Batch | 2020-24 | Date | 13.10.2023        | FN   |
| Time: 08:10 - 09:40 a.m<br>(90 Minutes) | Answer All Questions            |       |         |      | Maximum: 50 Marks |      |

(K1: Remembering, K2: Understanding, K3: Applying, K4: Analyzing, K5: Evaluating)

|     |   |
|-----|---|
| CO1 | Apply the algorithms to manipulate output primitives such as line, circle, ellipse (K3)                                     |
| CO2 | Demonstrate transformations, representations and clipping on 2D objects and map window to viewport transformations (K3)     |
| CO3 | Apply three Dimensional concepts like representations, geometric transformations, and projections (K3)                      |
| CO4 | Understand the working of different illumination and color models used to render an animation scene (K2)                    |
| CO5 | Understand different types of multimedia file formats, compression techniques and design basic 3D Scenes using Blender (K2) |

**Part – A (6×2 = 12 Marks)**

|    |   |     |                |
|----|---|-----|----------------|
| K1 | 1. What is exterior clipping? Give an example scenario.   | CO2 | 1.4.1          |
| K2 | 2. Explain the four cases of clipping a line segment PQ of a polygon using Sutherland-Hodgeman Polygon clipping algorithm.  | CO2 | 2.1.3          |
| K2 | 3. Illustrate the calculation of the transformed point $(x',y')$ in a viewport with co-ordinates $XV_{min}, XV_{max}, YV_{min}, YV_{max}$ given $(x,y)$ in the window with co-ordinates $XW_{min}, XW_{max}, YW_{min}$ and $YW_{max}$ . | CO2 | 1.4.1          |
| K3 | 4. Identify the type of the following 3D object and write its characteristics.<br>   | CO3 | 1.4.1          |
| K1 | A point $P(x,y,z)$ is translated using a translation vector $T(a,b,c)$ . Write the transformation matrix to find the transformed point $P'$ .   | CO3 | 1.1.1<br>1.4.1 |
| K1 | 6. List any two three-dimensional display methods and their applications.   | CO3 | 1.4.1          |

*Hobby*

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**Part – B (3×6 = 18 Marks)**

|    |  |     |                          |
|----|--|-----|--------------------------|
| K3 | 7. Apply Weiler-Atherton polygon clipping algorithm for the following example.       | CO2 | 1.4.1<br>2.1.3<br>13.3.1 |
|    |  |     |                          |
| K3 | 8. Apply all three types of text clipping for the strings shown in the figure below. | CO2 | 1.4.1<br>2.1.3<br>13.2.1 |
|    |  |     |                          |
| K2 | 9. Explain in detail how an object is reflected in 3D space. Draw suitable diagrams. | CO3 | 1.3.1<br>1.4.1<br>13.3.1 |

**Part – C (2×10 = 20 Marks)**

|    |  |     |                          |
|----|--|-----|--------------------------|
| K3 | 10. A cube lies in a 3D space with $x, y, z$ as the principal axis in a right handed co-ordinate system. An axis $A$ passes through points $P(x_1, y_1, z_1)$ and $Q(x_2, y_2, z_2)$ and is not parallel to any of the principal axes. Apply rotation on the cube by an angle $\theta$ about the axis $A$ . Illustrate the steps and matrices of the transformation. | CO3 | 1.4.1<br>2.4.1<br>13.3.1 |
|    | (OR)   |     |                          |
| K3 | 11. Apply the composite transformation for reducing a unit cube to half its volume by keeping the centroid fixed. Use only homogeneous coordinate representation.  | CO3 | 1.4.1<br>2.4.1<br>13.3.1 |
| K3 | 12. Apply Cohen Sutherland clipping algorithm and clip the line $A (5,120)$ , $B (50,80)$ with respect to the window with $Xleft=10$ , $Xright=60$ , $YBot=10$ , $Ytop=100$ .  | CO2 | 1.4.1<br>2.1.3<br>13.3.1 |
|    | (OR)   |     |                          |
| K3 | 13. Apply the Liang-Barsky algorithm to clip the line $P1(40,15)$ $P2(75,45)$ with respect to the window with $(XW_{min}, YW_{min}) = (50,10)$ and $(XW_{max}, YW_{max}) = (80,40)$ .  | CO2 | 1.4.1<br>2.1.3<br>13.3.1 |



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**Department of Computer Science and Engineering**

**Continuous Assessment Test – III**

**Question Paper**

|   |                                 |       |         |      |                   |      |
|---|---------------------------------|-------|---------|------|-------------------|------|
| Degree & Branch                         | B.E CSE                         |       |         |      | Semester          | VII  |
| Subject Code & Name                     | UCS1703 Graphics and Multimedia |       |         |      | Regulation:       | 2018 |
| Academic Year                           | 2023-2024<br>ODD                | Batch | 2020-24 | Date | 07.11.2023        | FN   |
| Time: 08:10 - 09:40 a.m<br>(90 Minutes) | Answer All Questions            |       |         |      | Maximum: 50 Marks |      |

(K1: Remembering, K2: Understanding, K3: Applying, K4: Analyzing, K5: Evaluating)

|     |   |
|-----|---|
| CO1 | Apply the algorithms to manipulate output primitives such as line, circle, ellipse (K3)                                     |
| CO2 | Demonstrate transformations, representations and clipping on 2D objects and map window to viewport transformations (K3)     |
| CO3 | Apply three Dimensional concepts like representations, geometric transformations, and projections (K3)                      |
| CO4 | Understand the working of different illumination and color models used to render an animation scene (K2)                    |
| CO5 | Understand different types of multimedia file formats, compression techniques and design basic 3D Scenes using Blender (K2) |

**Part – A (6×2 = 12 Marks)**

|    |   |     |                |
|----|---|-----|----------------|
| K1 | 1. What are the three types of Axonometric projections?   | CO3 | 1.4.1          |
| K2 | 2. Compare and contrast Cavalier and Cabinet projections.   | CO3 | 1.4.1          |
| K3 | 3. Identify the type of projection shown in the figure below and draw the position of the view plane with respect to the co-ordinate origin to achieve this projection.<br><br> | CO3 | 1.3.1<br>1.4.1 |
| K1 | 4. What is ambient light and what is the contribution of ambient light in adding visual realism to a scene?   | CO4 | 1.2.1          |

|    |  |     |                |
|----|--|-----|----------------|
| K3 | 5. Keyframe $k$ shows a racecar parked in its initial position. Keyframe $k+n$ shows the car participating in the race. Identify how the in-between frames from keyframe $k$ to keyframe $k+n$ are placed on a timeline graph to show the acceleration of the car. | CO4 | 1.1.1<br>2.1.2 |
| K1 | 6. List two modern multimedia tools for rendering 2D and 3D graphics.  | CO5 | 5.1.1          |

### Part – B (3×6 = 18 Marks)

|    |  |     |                 |
|----|--|-----|-----------------|
| K2 | 7. Explain the steps in the design of an animation sequence.   | CO4 | 13.3.1          |
| K3 | 8. A scene is rendered where the objects appear shiny and have highlights. Identify and derive the component of the illumination model used to render the scene when the vector between the light source and the object is given as $s$ and vector between the object and the viewer is given as $v$ . | CO4 | 2.1.2<br>13.2.1 |
| K3 | 9. A color C in a three primary color model is defined with components $(c_1, c_2, c_3)$ . Identify the representation of color C in additive and subtractive color systems and explain it with one example for each system..  | CO4 | 2.1.2<br>13.2.1 |

### Part – C (2×10 = 20 Marks)

|      |   |     |                 |
|------|---|-----|-----------------|
| K3   | 10. Consider a 3D coordinate system where y-axis is vertical, and z-axis is pointing towards the viewer. A line with endpoints $A(15,10,5)$ and $B(10,15,20)$ is projected onto XY plane. Apply Cavalier projection with $\phi = 45$ degrees and calculate the projected line endpoints.  | CO3 | 1.4.1<br>13.3.1 |
| (OR) |   |     |                 |
| K3   | 11. A point $(x,y,z)=(3,2,1)$ is projected using oblique parallel projection to a position $(x_p,y_p)$ on the XY plane. The projector makes an angle $\alpha = 45$ with the line of length L on the projection plane that joins $(x_p,y_p)$ and $(x,y)$ . The line L makes an angle $\phi = 30$ with the horizontal direction in the projection plane. Apply the projection to find the point $(x_p,y_p)$ . | CO3 | 1.4.1<br>13.3.1 |
| K2   | 12. Explain in detail the JPEG Compression scheme.  | CO5 | 1.4.1           |

(OR)

|    |   |     |       |
|----|---|-----|-------|
| K2 | 13. Explain with a neat diagram the architecture of a multimedia system and its defining objects. | CO5 | 1.4.1 |
|----|---|-----|-------|

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**Department of Computer Science and Engineering**

**Continuous Assessment Test – I**

**Question Paper**

|                                     |  |       |           |      |                   |      |
|-------------------------------------|--|-------|-----------|------|-------------------|------|
| Degree & Branch                     | B.E. Computer Science and Engineering      |       |           |      | Semester          | VII  |
| Subject Code & Name                 | UCS1704 – Management and Ethical Practices |       |           |      | Regulation:       | 2018 |
| Academic Year                       | 2023 – 2024<br>(ODD)                       | Batch | 2020-2024 | Date | 08.09.2023        | FN   |
| Time: 08:10 – 09:40 AM (90 Minutes) | Answer All Questions                       |       |           |      | Maximum: 50 Marks |      |

**Part – A (6×2 = 12 Marks)**

|    |  |     |        |
|----|--|-----|--------|
| K1 | 1. What are the essential skills of Managers?      | CO1 | 10.2.1 |
| K1 | 2. List down the types of departmentalization.     | CO2 | 10.1.3 |
| K2 | 3. Distinguish between plan and goal.              | CO1 | 10.2.1 |
| K1 | 4. List all the decision-making biases and errors. | CO1 | 10.1.3 |
| K1 | 5. Specify the functions of management.            | CO1 | 10.2.1 |
| K1 | 6. Define Organization.                            | CO1 | 10.1.3 |

**Part – B (3×6 = 18 Marks)**

|    |  |     |       |
|----|--|-----|-------|
| K2 | 7. General Administrative Theories of Henry Fayol and Max Weber give contrasting ideas. Discuss the key features of each.  | CO1 | 8.1.1 |
| K2 | 8. Explain the classification of managers in detail.   | CO1 | 6.1.1 |
| K3 | 9. At the Emil Sporting Goods factory in Canada, 150 workers make football used in the National Football League, college and high school football games. In order to achieve high productivity, the workers specialize in different tasks such as molding, stitching and sewing, lacing, and so forth. Beyond a point, the management observed that productivity started to degrade.<br><br>Using a suitable graph, illustrate the situation that the management has observed and compare it with their performance earlier. | CO2 | 6.1.1 |

**Part – C (2×10 = 20 Marks)**

|    |  |     |                  |
|----|--|-----|------------------|
| K3 | 10. Compare and contrast quantitative approach and contingency approach for international business.<br><br>NMK is a start-up company that designs mini robots for water quality assessment. Derive your inferences on both approaches when applied for marketing these mini-robots | CO1 | 1.3.1,<br>10.2.1 |
|----|--|-----|------------------|

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low  
Gale  
Tunis

|    |  |     |                  |
|----|--|-----|------------------|
|    | (OR)   |     |                  |
| K3 | <p>11. Distinguish a strong cultured organization from a weak cultured organization.</p> <p>Las Vegas Productions is a production company. In order to establish and maintain it as a strong cultured organization right from its launching, identify the major steps involved.</p>  | CO1 | 1.3.1,<br>10.2.1 |
| K3 | <p>12. Consider the following scenarios:</p> <p><b>Scenario 1:</b></p> <p>Kumar is a mid-level manager. He keeps all his subordinates under a lot of discipline. His employees complain about the waste of time and effort, as they feel that nothing is being assigned in a proper way and a proper place, also no proper schedule is made for working.</p> <p><b>Scenario 2:</b></p> <p>ABC is a company which takes care of the fact that the confidence of the employees should always be at its peak. For this reason, they give assurance to their employees for employment for a minimum fixed tenure of time.</p> <p>a. Identify which principle of management is violated in scenario 1. Infer from the scenario and suggest a suitable managerial solution to overcome it.</p> <p>b. Identify which principle of management is followed in scenario 2. How this principle supports your claim?</p>   | CO1 | 12.1.1           |
|    | (OR)   |     |                  |
| K3 | <p>13. Consider the following scenarios:</p> <p><b>Scenario 1:</b></p> <p>Ram is the owner of a printing press. The size of his organization has increased during the recent past. There are many employees who work in his organization. The organization is considered good and has earned a lot of reputation in the market. However, when it comes to making key decisions in the organization, he never considers the opinions of his subordinates. Even though the size of the organization has increased he tries to take all the key decisions on his own.</p> <p><b>Scenario 2:</b></p> <p>Pritam Vehicles is a vehicle manufacturing company. The company has the same unit producing both lorries and vans. This leads to confusion among the employees regarding the reporting as well as differentiation of work.</p> <p>a. Identify the managerial approach he is following in scenario 1. Give a suggestion in order to overcome this issue with suitable justification.</p> <p>b. Identify which principle of Fayol is violated in scenario 2. Why? State the principle. Give an immediate outcome of the violation of this principle.</p> | CO1 | 12.1.1           |

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Department of Computer Science and Engineering

**Continuous Assessment Test – II**

**Question Paper**

|  |  |       |             |      |                   |      |
|--|--|-------|-------------|------|-------------------|------|
| Degree & Branch                        | B.E. Computer Science and Engineering      |       |             |      | Semester          | VII  |
| Subject Code & Name                    | UCS1704 – Management and Ethical Practices |       |             |      | Regulation:       | 2018 |
| Academic Year                          | 2023 – 2024<br>(ODD)                       | Batch | 2020 - 2024 | Date | 16/10/2023        | FN   |
| Time: 08:10 – 09:40<br>AM (90 Minutes) | Answer All Questions                       |       |             |      | Maximum: 50 Marks |      |

(K1: Remembering, K2: Understanding, K3: Applying, K4: Analyzing, K5: Evaluating)

|      |  |
|------|--|
| CO1: | Describe basic and applied fields of Management (K2)           |
| CO2: | Describe and practice Managerial skills (K3)                   |
| CO3: | Describe and practice Engineering Ethics and Human Values (K3) |
| CO4: | Describe and use safety, responsibility, and rights (K3)       |
| CO5: | Describe ethical issues in cybersecurity (K2)                  |

#### Part – A (6×2 = 12 Marks)

|    |   |     |               |
|----|---|-----|---------------|
| K2 | 1. Explain the need for motivation in an organization                                   | CO2 | 10.1          |
| K2 | 2. Elaborate the various senses of engineering ethics.                                  | CO3 | 10.1.<br>8.2. |
| K2 | 3. Illustrate the new organizational configurations. <i>Honeycomb, Cloud, Virtual</i> . | CO2 | 10.1          |
| K2 | 4. Compare and contrast consensus and controversy.                                      | CO3 | 10.1.<br>8.2. |
| K1 | 5. Which are the differing views of professionals?                                      | CO3 | 12.1          |
| K2 | 6. Differentiate moral dilemma and moral autonomy.                                      | CO3 | 12.1          |

#### Part – B (3×6 = 18 Marks)

|    |  |     |             |
|----|--|-----|-------------|
| K2 | 7. Outline the various senses of responsibility.   | CO3 | 10.1        |
| K2 | 8. Give the pictographic representation and highlight the Kohlberg and Gilligan theories of moral development. Summarize the criticisms for both theories. <i>(Green, Hindu)</i>   | CO3 | 8.2         |
| K3 | 9. Interpret the following scenario and give your opinion to prevent this from happening.<br><br>A doctor terminated a female staff member who had been working for him for nine months. She then claimed that her civil rights were violated and that she was discriminated because of her age. She was 46 years old. During an investigation, the doctor was asked to provide copies of her performance evaluations to justify the contention that the termination was based | CO3 | 10.1<br>8.2 |

|  |  |  |
|--|--|--|
|  | <p>on her performance, not her age. However, no performance evaluations had been done to any employees. This claim led to an out-of-court settlement.</p> <p><b>Considerations</b></p> <p>The employee had been working with the doctor for nine months and had not received a performance appraisal. She claimed that she was not aware that her performance was not satisfactory and was surprised when she was terminated. She alleged that the sole reason for her termination was her age — that the doctor wanted to hire a younger person. The doctor said she had been warned on several occasions, but nothing had been documented.</p> |  |
|--|--|--|

### Part – C (2×10 = 20 Marks)

|    |   |     |
|----|---|-----|
| K4 | <p>10. Having a car to get to work is a necessity for many workers. When two crucial employees of Vurv Technology in Jacksonville, Florida, had trouble getting to work, owner Derek Mercer decided to buy two inexpensive used cars for the employees. He said, "I felt that they were good employees and a valuable asset to the company."</p> <p>One of the employees who got one of the cars said, "It wasn't the nicest car. It wasn't the prettiest car. But it is an overwhelming feeling of worry replaced by enlightenment. The 80-hour weeks we worked after that never meant anything. It was "give and take". I was giving and the company was definitely giving back.</p> <ol style="list-style-type: none"> <li>Examine what motivated the employees.</li> <li>Infer which motivational theory well suits the above mentioned scenario.</li> </ol>  | CO2 |
|    | (OR)  |     |
| K4 | <p>11. You are appointed as a Human Resource Manager to Qubitnew Company. It is a well-established organization. Design a suitable HR Management Process with a suitable diagram for recruiting new employees in the company.</p>   | CO2 |
|    | <p>12. Smith and Tom work in an experimental testing laboratory for Acme Corp. Smith has been the main testing engineer for five years and is up for promotion to laboratory supervisor (includes the testing laboratory and several other laboratories). Tom is being trained as a potential replacement as the testing engineer. The laboratories division supervisor is Brown who is retiring soon.</p> <p>The company's latest development project is an OEM control module for a well water pump. The pump manufacturer has promised an important contract if the module meets their approval. The original module prototype met the desired specifications with the exception of the temperature test. The prototype was sent back to the development engineers for rework. The next iteration of the module was sent to the testing laboratory for testing, but the temperature test was delayed since the needed equipment was out for recalibration.</p> |     |
| K4 | <p>Tom wrote the report for the original prototype and the draft report for the reworked prototype. At the weekly laboratory's division meeting, Smith reports to Brown that the latest module "meets all tests" and that the report has "good number of" equipments for temperature test. Tom questions Smith privately after the meeting since his draft report indicated that temperature testing was delayed. Smith says that the development team fix should be satisfactory, i.e. it was confirmed through simulation, and that they can do further testing later to confirm the simulation numbers once the needed testing equipment is returned.</p> <p>Smith says that a positive report to the manufacturer cannot be delayed or their testing laboratory "looks bad" and the contract could be at risk. Then, Tom privately speaks to Brown about the situation including his concern that his (Tom) name is on the overall</p>                        | CO3 |
|    |   |     |

esting report. Brown tells him that Smith is responsible for the details in the report and that he (Tom) should learn to work with Smith if he wants to take over the testing laboratory.

- a. Examine the ethical questions in this situation.
- b. Analyze the scenario and give your insights about Tom's behaviour.
- c. After the private conversations with Smith and Brown, examine whether Tom has an ethical responsibility to speak to Smith again or not?

(OR)

13. Bart Matthews, a robot operator at Cybernetics, Inc., has been killed by an out-of-control robot named Robbie. The creator of the robot, Silicon Technologies, is also in a tight financial position and had hoped that the robot would put the company back on its feet.

It has been determined that several situations contributed to the death of Matthews:

- Improper methodology was used in developing the software.
  - Testing of the software was faked.
  - The company pressured Robbie's creators to bypass testing.
  - Part of the software used in the robot was stolen from another vendor's application.
  - The programmer did not understand or know the code which he used.
  - Security measures used were illegal, and therefore all information gathered in regard to the case might not be permissible in court.
  - The project leader did not understand or use proper design methodologies.
  - The end-user interface was designed improperly.
- a. With suitable justification, inspect who is at fault.
  - b. Analyze the situations that are unethical.
  - c. From the given situation, give your inference regarding the major contributor/s to the death of Bart Matthews.

C

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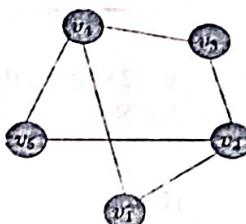
**Department of Computer Science and Engineering**

**Continuous Assessment Test – I**

**Question Paper**

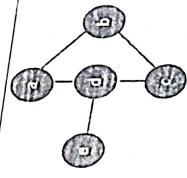
|   |                                      |              |             |             |                      |            |
|---|--------------------------------------|--------------|-------------|-------------|----------------------|------------|
| <b>Degree &amp; Branch</b>                      | B.E., Computer Science & Engineering |              |             |             | <b>Semester</b>      | <b>7</b>   |
| <b>Subject Code &amp; Name</b>                  | UCS1722 – Social Network Analysis    |              |             |             | <b>Regulation:</b>   | <b>201</b> |
| <b>Academic Year</b>                            | 2023-2024<br>ODD                     | <b>Batch</b> | 2020 - 2024 | <b>Date</b> | 11.09.2023           | <b>FN</b>  |
| <b>Time: 08:15 - 09:45 a.m<br/>(90 Minutes)</b> | <b>Answer All Questions</b>          |              |             |             | <b>Maximum: 50 M</b> |            |

**Part – A (6×2 = 12 Marks)**

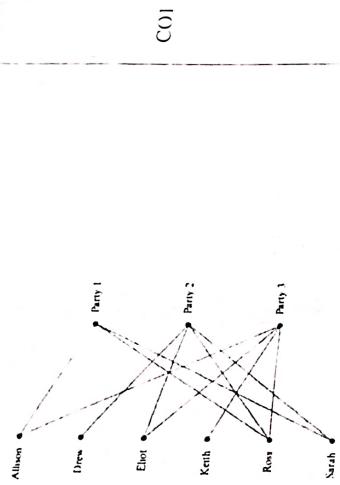
|    |   |     |    |
|----|---|-----|----|
| K1 | 1. What is Social Network Analysis?   | CO1 | 1. |
| K1 | 2. What are the different kinds of global structures of social networks?  | CO1 | 1. |
|    | 3. Apply the social network concepts to find the degree centrality of the nodes in the given network.   | CO1 |    |
| K3 |   |     | 2. |
| K3 | 4. Assume a network of 5 countries that shares common borders such that each country shares common borders with all other countries. Identify whether the network is a directed or undirected and find out the maximum possible borders that can exist between the countries. | CO1 | 2. |
| K3 | 5. Identify a real-world example of an actor who might be powerful but not central? Who might be central, but not powerful?   | CO2 | 2. |
| K1 | 6. What are the different notational schemes to represent social network mathematically?  | CO2 | 1  |

**Part – B (3×6 = 18 Marks)**

|    |   |     |    |
|----|---|-----|----|
| K2 | 7. Explain the different graph models for social networks and their pros and cons.  | CO1 | 1. |
| K3 | 8. Apply the social network concepts to find the betweenness centrality and closeness centrality measures for all the nodes in the network given below. | CO1 | 2. |



9. Build one-mode affiliation network, where the actors for the given two-mode affiliation parties they attended.



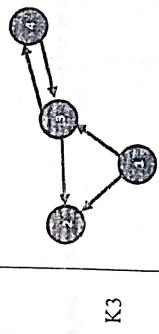
K3

- Part – C ( $2 \times 10 = 20$  Marks)**
- K2 10. Explain the different dimensions of Social Capital by Nahapiet and Ghoshal.

(OR)

CO1

- K2 11. Explain the data collection complexities in social networks and detail the alternatives.
- K2 12. Apply the appropriate matrix operations for the network shown below and find the following measures.

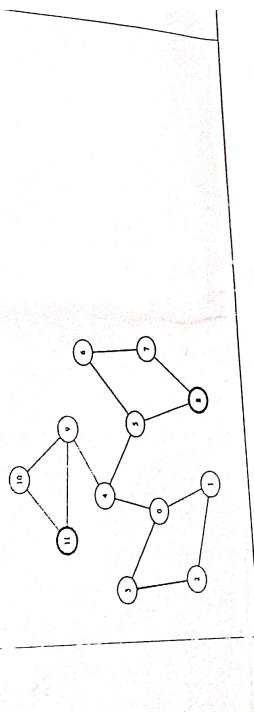


- K3  
CO2
- Distance/connectivity matrix
  - Geodesic of length 2
  - Indegrees of nodes
  - Outdegrees of nodes
  - Density of the network

(OR)

1.3. Apply the graph theory concepts for social networks and find the following measures for the network shown below.

- a) Eccentricity of Node3
- b) A Walk
- c) A Trial
- d) Tour in the graph
- e) Nodal degree of all nodes
- f) Mean nodal degree
- g) Variance of degree
- h) Density of the graph
- i) Cut-Point or node connectivity
- j) Edge connectivity



K3

Register Number

**Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam – 603 110**

(An Autonomous Institution, Affiliated to Anna University, Chennai)

**Department of Computer Science and Engineering**

**Continuous Assessment Test – II**

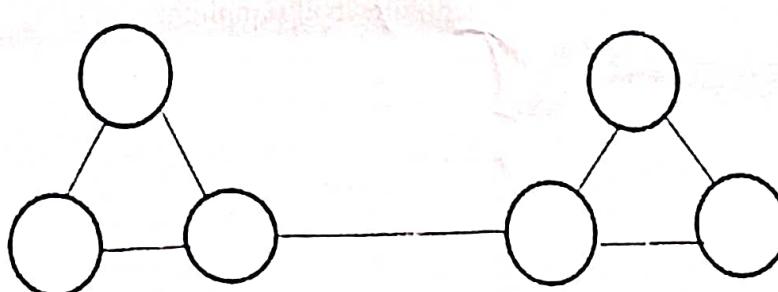
**Question Paper**

|   |                                      |       |             |      |                   |      |
|---|--------------------------------------|-------|-------------|------|-------------------|------|
| Degree & Branch                         | B.E., Computer Science & Engineering |       |             |      | Semester          | 7    |
| Subject Code & Name                     | UCS1722 – Social Network Analysis    |       |             |      | Regulation:       | 2018 |
| Academic Year                           | 2023-2024<br>ODD                     | Batch | 2020 - 2024 | Date | 17.10.23          | FN   |
| Time: 08:10 - 09:40 a.m<br>(90 Minutes) | Answer All Questions                 |       |             |      | Maximum: 50 Marks |      |

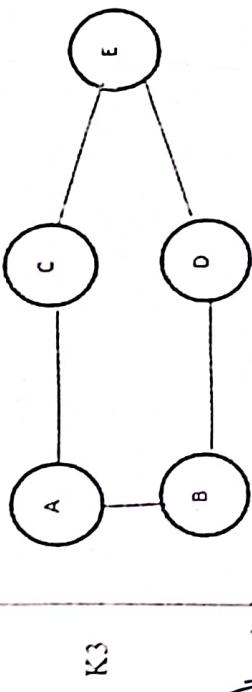
**Part – A (6×2 = 12 Marks)**

|    |  |     |       |
|----|--|-----|-------|
| K1 | 1. List any four examples of non-directional relations in social network.  | CO2 | 1.4.1 |
| K3 | 2. Identify the relations for the scenario “children playing together”.  | CO2 | 2.2.3 |
| K1 | 3. Why is detecting communities in a Social Network important?   | CO3 | 1.4.1 |
| K1 | 4. What is the rewritten form of the formula for the modularity of Newman and Girvan and write down what each term refers to.                | CO3 | 2.2.3 |
| K2 | 5. Differentiate between optimization-based and heuristics-based algorithms for solving Network Community Mining Problem in Social Networks. | CO3 | 2.2.3 |
| K3 | 6. Develop a <i>NetworkX</i> code to remove nodes with degree > 2 from the network.  | CO4 | 2.2.3 |

**Part – B (3×6 = 18 Marks)**

|    |  |     |       |
|----|--|-----|-------|
| K2 | 7. Explain the three categories of definitions for communities.  | CO3 | 1.4.1 |
| K3 | 8. Apply Newman-Girvan modularity to find the goodness of the partition for the network given below.<br><br> | CO3 | 2.4.2 |

9. Apply Girvan-Newman's algorithm to find the community in the below network.



K3

CO4

### Part - C (2×10 = 20 Marks)

K2 10. Explain the various optimization-based algorithms for detecting the communities in social networks.

(OR)

K2 11. Explain any three applications of community mining algorithms.

CO3

K2 12. Assume there is a large community-based network. A researcher wants to analyze the network based on certain criteria of interest. But he is clueless where to start. What are the different types of approaches he should follow to simplify the network for analysis. Write the *NetworkX* code for any one of the approaches. Also, suggest different ways to find the most influential node in the network.

CO4

(OR)

K4 13. Assume an API that retrieves the connection information between a particular user and his friends circle at several levels in a social network. The connections are directional and are in the following format.

Alice > bob

Dave < Alice

Carol > Alice

CO4

Write a *NetworkX* code to draw an Ego network for "Alice" at friend-of-friend level. Also, for the same network, write a *NetworkX* code to perform data collection using snowball sampling.

Register Number \_\_\_\_\_

**Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam – 603 110**  
 (An Autonomous Institution, Affiliated to Anna University, Chennai)  
**Computer Science and Engineering**  
**Continuous Assessment Test – III**  
**Question Paper**

|   |                                       |                   |                                 |
|---|---------------------------------------|-------------------|---------------------------------|
| Degree & Branch                         | B.E. Computer Science and Engineering | Semester          | 7                               |
| Subject Code & Name                     | UCS 1722 Social Network Analysis      | Regulation:       | 2018                            |
| Academic Year                           | 2023-2024<br>ODD                      | Batch             | 2020 - 2024<br>Date 17.11.22 FN |
| Time: 08:10 – 09:40 a.m<br>(90 Minutes) | Answer All Questions                  | Maximum: 50 Marks |                                 |

**Part – A (6×2 = 12 Marks)**

|     |  |     |
|-----|--|-----|
| KL1 | 1. What is meant by triadic analysis?  | C04 |
| KL3 | 2. Identify the significance of the forbidden triads in a social network.  | C04 |
| KL2 | 3. How does visualization help in social network analysis?   | C05 |
| KL1 | 4. Which kind of network is suited for matrix-based visualization?   | C05 |
| KL3 | 5. Compare and Contrast the functionalities of the 3 most popular centrality measures used in social network analysis. | C05 |
| KL1 | 6. List the advantages of Node-Link Diagrams.  | C05 |

**Part – B (3×6 = 18 Marks)**

|     |  |     |
|-----|--|-----|
| KL2 | 7. Explain the various kinds of Node-Edge diagrams used for social network visualizations  | C05 |
| KL3 | 8. Identify the similarities and dissimilarities in the functionalities of user-centric, content-centric and hybrid visualization. | C05 |
| KL4 | 9. Distinguish between matrix based and node-link based diagrams.  | C05 |

**Part – C (2×10 = 20 Marks)**

|     |  |     |
|-----|--|-----|
| KL2 | 10. Discuss the different solutions that could be used to make visualization in readable form when scaling to larger networks.<br><br>(OR)   | C05 |
| KL2 | 11. Explain how the combination of matrix and node link diagrams is leveraged for better visualization.<br>12. Develop a NetworkX code to draw a Krackhardt kite graph with 7 nodes and display the following:<br>a) adjacency list<br>b) neighbours of each node in the graph<br>c) depth first traversal with node 0 as starting point<br>d) Shortest path from node 0 to node 7 | C05 |
| KL3 |  | C05 |

|     |  |
|-----|--|
|     | e) Average shortest path of the graph<br><br>(OR)  |
| KL3 | <p>13 a. Apply Node-link based visualization technique to draw the below network using NetworkX code as a labelled weighted graph. Node's colors should be in green and the link's colors should be in blue. Use spring layout for positioning.</p> <p>b. Write an algorithm to perform an appropriate traversal to analyze a person's network connection at a deeper level. Using NetworkX command implement the traversal method and display the list of nodes in the order it was visited.</p> <pre> graph TD     A((A)) --- 4  B((B))     A --- 2  C((C))     A --- 1  D((D))     B --- 1  C     B --- 2  D     C --- 4  D     C --- 2  E((E))     D --- 2  E   </pre> |

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| <b>Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam – 603 110</b> |   |
| (An Autonomous Institution, Affiliated to Anna University, Chennai)           |   |
| <b>Computer Science and Engineering</b>                                       |   |
| <b>Continuous Assessment Test -1</b>  |   |
| <b>Question Paper</b>   |   |
| <b>Degree &amp; Branch</b>  | <b>B.E (CSE)</b>  |
| <b>Subject Code &amp; Name</b>  | <b>UCS1728 USER EXPERIENCE DESIGN</b>                                 |
| <b>Academic Year</b>  | <b>2023-2024</b>  |
| <b>Time: 08:10 - 09:40 AM</b><br><b>(90 Minutes)</b>                          | <b>Batch</b> <b>2020-2024</b> <b>Date</b> <b>12.09.2023</b> <b>FN</b> |
| <b>Answer All Questions</b>   |   |
| <b>Maximum: 50 Marks</b>  |   |

(K1: Remembering, K2: Understanding, K3: Applying, K4: Analyzing, K5: Evaluating)

|       |  |
|-------|--|
| CO 1: | Identify the users and learn the entire user experience lifecycle of agile UX design(K2) |
| CO 2: | Develop a deep understanding of UX design and evaluation(K2)                             |
| CO 3: | Create efficient prototype to communicate and evaluate the design definition(K3)         |
| CO 4: | Apply UX design in a case study(K3)  |
| CO 5: | Learn the customer experience and testing(K4)  |

**Part – A (6×2 = 12 Marks)**

|   |   |    |     |                         |
|---|---|----|-----|-------------------------|
| 1 | Name the components of UX design.                               | K1 | CO1 | 1.4.1<br>2.1.1<br>3.1.1 |
| 2 | What kind of interaction can be a success factor for UX design? | K1 | CO1 | 1.4.1<br>2.1.1<br>3.1.1 |
| 3 | How model driven inquiry can streamline the UX design?          | K1 | CO1 | 1.4.1<br>2.1.1<br>3.1.1 |
| 4 | List out the features of contextual inquiry.                    | K1 | CO2 | 1.4.1<br>2.2.2<br>3.1.1 |
| 5 | Define a flow model.  | K1 | CO2 | 2.2.2<br>3.1.1          |
| 6 | Give a few examples of UX requirements.                         | K1 | CO2 | 1.4.1<br>2.2.2<br>3.1.1 |

**Part – B (3×6 = 18 Marks)**

|    |   |    |     |                        |
|----|---|----|-----|------------------------|
| 7  | How is Candy Crush Saga game so successful and popular? Identify the reasons with suitable examples.  | K3 | CO1 | 1.4.<br>2.1.<br>3.1.   |
| 8  | Discuss the steps involved in the user work role model.   | K2 | CO1 | 1.4.<br>2.1.<br>3.1.   |
| 9  | Prepare the UX requirements for the following case study.   | K3 | CO2 | 1.4.<br>2.2.2<br>3.1.1 |
| 10 | A technology company is designing a new smartphone model with an option to download an email file by connecting a Bluetooth device to the smartphone. |    |     |                        |

**Part – C (2×10 = 20 Marks)**

|    |   |    |     |                      |
|----|---|----|-----|----------------------|
| 10 | Illustrate the UX Design process life cycle.<br><br>How do you improve the quality of UX design? Explain.   | K2 | CO1 | 1.4.<br>2.1.<br>3.1  |
| 11 | (OR)<br><br>Explain which kind of data is better for deriving UX experience: qualitative or quantitative?   | K2 | CO1 | 1.4.<br>2.1.<br>3.1  |
| 12 | Prepare the work activity notes for the given case study.<br><br>A platform that aims to help creators grow their communities by recognizing and rewarding their base of supporters. It tackles a curious problem that 99% of fans who contribute in non-monetary ways don't get the same content, access, and recognition they deserve. This means the creators need a way to identify their fans across all social platforms to grow their business and give recognition. | K3 | CO2 | 1.4.<br>2.2.<br>3.1. |
| 13 | (OR)<br><br>Identify the steps to gather UX requirements and validate it, so that it will help you find out what you need before jumping to design.   | K3 | CO2 | 1.4.<br>2.2.<br>3.1. |



Prepared By

PAC Members  
Approved By  
(HOD-CSE)

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Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam – 603 110  
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Computer Science and Engineering

Continuous Assessment Test -2

Question Paper

| Degree & Branch                        | B.E                            | Semester    | VII            |
|--|--------------------------------|-------------|----------------|
| Subject Code & Name                    | UCS1728 USER EXPERIENCE DESIGN | Regulation: | 2018           |
| Academic Year                          | 2023-2024<br>ODD               | Batch       | 2020-2024      |
| Time: 08:15 - 09:45 AM<br>(90 Minutes) | Answer All Questions           | Date        | .10.2023<br>FN |
| Maximum: 50 Marks                      |                                |             |                |

(K1: Remembering, K2: Understanding, K3: Applying, K4: Analyzing, K5: Evaluating)

|      |  |
|------|--|
| CO1: | Identify the users and learn the entire user experience lifecycle of agile UX design(K2) |
| CO2: | Develop a deep understanding of UX design and evaluation(K2)                             |
| CO3: | Create efficient prototype to communicate and evaluate the design definition(K3)         |
| CO4: | Apply UX design in a case study(K3)  |
| CO5: | Learn the customer experience and testing(K4)  |

Part – A (6x2 = 12 Marks)

|   |   |    |     |        |
|---|---|----|-----|--------|
| 1 | Name the various data models that are used to update flow model in UX design.               | K2 | C02 | 2.2.2  |
| 2 | Identify and list the importance of user stories in UX design.                              | K3 | C02 | 3.1.1  |
| 3 | Why is prototype fidelity important?  | K2 | C02 | 3.1.1  |
| 4 | What is the difference between the top down and the bottom up approach in UX?               | K2 | C03 | 3.1.2  |
| 5 | Does the user's mental model different from the Traditional? Identify the reasons and list. | K3 | C03 | 3.1.2  |
| 6 | Outline a few interactions you can include in a storyboard.                                 | K2 | C03 | 14.1.2 |

Part – B (3x6 = 18 Marks)

|   |   |    |     |       |
|---|---|----|-----|-------|
| 7 | Build the depth and breadth prototype design for a train ticket booking scenario in IRCTC software.           | K3 | C02 | 1.4.1 |
| 8 | Construct the flow model using physical work environment model concept to generate a cinema ticket in a mall. | K3 | C02 | 1.4.1 |
| 9 | Discuss the differences between storyboard and wireframe using suitable examples.                             | K2 | C03 | 3.1.2 |

**Part – C (2×10 = 20 Marks)**

|  |                           |                                    |
|--|---------------------------|------------------------------------|
| <p>The following are the objectives of IRCTC software.</p> <p>1. Improvement in ticket booking<br/>     2. Live tracking of trains on IRCTC platform<br/>     3. Making available the latest government approved food rate card<br/>     4. Quick complaint lodging and resolution mechanism<br/>     5. Transparent refund mechanism</p> <p>10 Identify their corresponding user stories for each objective of IRCTC software.<br/>     For an objective, develop wire flow prototype design. (5+5)</p>   | <p>(OR)</p> <p>K3 CO2</p> | <p>1.4.1<br/>2.2.2</p>             |
| <p>The IPL ownerships of franchises are bought at an auction by wealthy celebrities, politicians, and entrepreneurs. Shah Rukh Khan, Preity Zinta, N. Srinivasan, Mukesh Ambani, and Sanjiv Goenka are some famous personalities who have ownership in these teams. They buy these teams by bidding in an auction. In this auction, the money is paid by the team owners to the BCCI. Therefore, this is a major source of revenue for IPL.</p> <p>11 Draw the flow model, for the IPL case study given above, by applying the (1) task structure model (2) artifact model (5+5)</p> | <p>K3 CO2</p>             | <p>1.4.1<br/>2.2.2</p>             |
| <p>12 a) Explain the relationship between mental model and conceptual design.(5)<br/>     b) Discuss the significance of the conceptual design in UX design. (5)</p>   | <p>(OR)</p>               | <p>K2 CO3<br/>14.1.3<br/>3.1.2</p> |
| <p>13 a) Discuss the creation of interaction design process in UX design. (5)<br/>     b) Explain how the interaction design supports UX design. (5)</p>   |                           | <p>K2 CO3<br/>14.1.3<br/>3.1.2</p> |