

# Asha M. Tarsadia Institute of Computer Science and Technology

## Uka Tarsadia University

B.Tech. Computer Science and Engineering (CSE)/ B.Tech. CE (Software Engineering)/  
B.Tech. CSE (Cloud Computing, Cyber security, Artificial Intelligence and Machine  
Learning)/B. Tech Computer Engineering/B. Tech Information Technology

### Internal Examination – 1

#### **Subject Name & Subject Code: Data Structures and Algorithms CE4015**

**Maximum Marks: 30**

**Date: 11/03/2024**

**Timing: 09:00 AM to 10.30 AM**

#### **General Instructions:**

1. Take appropriate assumptions whenever necessary.
2. Figures on the right indicate full marks allocated to the questions.
3. Draw Diagrams/Figures with pencil/black ink pen only.
4. Attempt all the questions.

**Q-1 Answer the following in brief. (Any 2) 6**

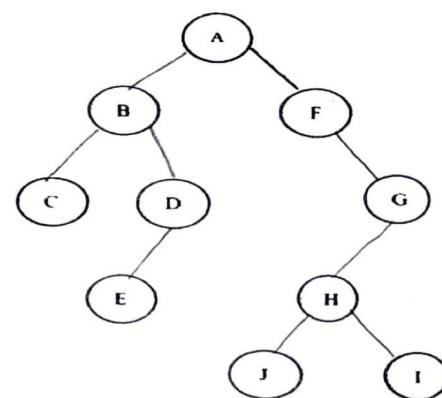
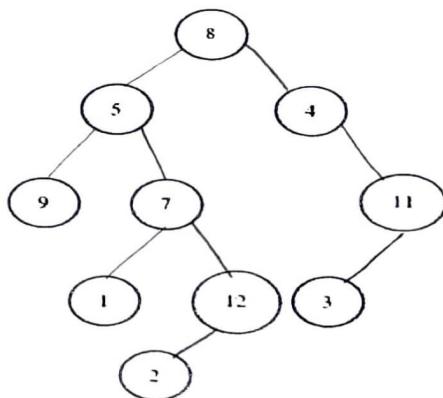
- 1 Write the difference between linear and non-linear data structures.
- 2 Write algorithm to match the pattern in given strings.
- 3 List Operations on array. Explain any two in brief.

**Q-2 Do as directed. (Any 3) 18**

- 1 Write algorithm to (a) Delete the last node from a singly linked list (b) Insert the first node in the singly linked list.
- 2 Write algorithm to (a) Enqueue and (b) Dequeue element to/from the circular queue.
- 3 Define Stack. Write algorithms to perform Push and Pop operations on the stack with example.
- 4 Convert the following infix expression into the prefix expression. Show the Stack traces.  
$$(A*B)^(C+D)*(E/F+G+H)$$

**Q-3 Do as directed. (Any 1) 6**

- 1 Construct a binary tree from the given traversals. Also mention the steps.  
In-order: 8-4-10-9-11-2-5-1-6-3-7  
Pre-order: 1-2-4-8-9-10-11-5-3-6-7
- 2 Determine the in-order, pre-order and post-order traversals from given binary trees.



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## **Internal Examination – 1**

**Subject Name: Operating System (CE 4016)**

**Maximum Marks:30**

**Date:11/03/2024**

**Time: 2:00pm-3:30pm**

**Q1. Answer the following in brief (Any 5) 10m**

1. What is operating system? List out the services of operating system.
2. Differentiate monolithic kernel and microkernel structure.
3. What is system call? Enlist its types.
4. Which algorithm is used for deadlock ignorance? Explain.
5. Explain deadlock detection for single resource.
6. What is thread and enlist the types of threads?

**Q2. Do as directed (Any 4) 20m**

1. Explain types of operating system in detail.
2. What is deadlock? Explain necessary and sufficient conditions for deadlock to occur.
3. What is process? Explain 5 state process model and explain each state transition.
4. What is the use of PCB? Discuss the content of PCB and how the PCB's are chain together to form a list of ready processes.

5. Consider the following set of processes with the length of CPU burst given in milliseconds.

Process	Priority	Burst Time
P <sub>1</sub>	3	10
P <sub>2</sub>	1	01
P <sub>3</sub>	3	02
P <sub>4</sub>	4	01
P <sub>5</sub>	2	05

The processes are assumed to have arrived at the same time = 0. Draw the Gantt chart that defines the execution of the processes using the following scheduling algorithm SJF, Priority (1=High priority), and Round Robin with quantum or time slice=2. Calculate average turnaround time, and average waiting time?

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### Internal Examination – 1

#### **Subject Name/Code: IT4020 - Advanced Web Development**

**Maximum Marks: 30**

**Date: 12/03/2024**

**Timing: 09:00 AM to 10.30AM**

#### **General Instructions:**

1. Take appropriate assumptions whenever necessary.
2. Figures on the right indicate full marks allocated to the questions.
3. Draw Diagrams/Figures with pencil/black ink pen only.
4. Attempt all the questions.

**Q-1 Answer the following in brief. (Any 5) 10**

- 1 What is JavaScript? Enlist the feature of JavaScript.
- 2 State the usage of typed array and explain the creation of the same using JavaScript.
- 3 Explain arrow function using an example.
- 4 What is Proxy? Enlist Proxy Traps.
- 5 Explain has() as reflect API.
- 6 Discuss default parameter passing and spread arguments to a function using a JavaScript

**Q-2 Do as directed. (Any 4) 20**

- 1 Using JavaScript, create a proxy object for an object named person that will check if the person is allowed to vote based on the age property.
- 2 Elaborate Iterators and Generators with suitable example.
- 3 Explain object creation using a) Factory pattern, b) Function constructor pattern, and c) Prototype pattern with using example.
- 4 What is asynchronous programming? Explain different ways of performing the same with appropriate example.
- 5 Write a JavaScript to implement promise chaining and explain all the Functions used in it with example.

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B.Tech. CSE/CE(SE)/CSE(CloudComputing)/CSE(AI&ML)/CSE(CyberSecurity)/CE/IT  
(4<sup>th</sup>Semester)

**Subject :IT4021-Mobile Application Development with iOS  
Internal Examination-1**

**Date: 12<sup>th</sup> March 2024**  
**Time: 2 PM to 3.30 PM**

**Max. Marks : 30**

**Instructions:**

1. Attempt all questions.
2. Follow usual meaning of abbreviations with respect to the subject.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks allocated to that question.

- Q-1 A) What is Inferred type? Write code snippet and explain when to use inferred type and when to specify type. [05]**
- OR
- A) Write and explain Swift function, which accepts integer array as an argument, and return minimum and maximum value from it. [05]**
- B) What is the use of connection? Explain outlets and actions with appropriate examples. [05]**
- OR
- B) With respect to auto layout, explain "Align" and "Add New Constraints" with appropriate examples.**
- Q-2 A) What is the use of UITextField? Write code snippet and explain any four useful properties of it. [05]**
- OR
- A) What is use of property observer? Write Swift code and explain property observer using "willSet" and "didSet". [05]**
- B) Explain UITabBarController and Tab Bar Items with necessary code snippet and diagram. [05]**
- OR
- B) With example and code snippet explain the use of "viewWillAppear( )" and "viewDidAppear( )".**
- Q-3 Answer following questions in detail. (Attempt any TWO) [2x5=10]**
- A) Related to table view, which two protocols needs to conform by ViewController? Write and explain sample Swift code for "numberOfRowsInSection" and "cellForRowAt".**
- B) Write Swift code to call following "createItem" function with at least two different syntaxes. What is the significance and use of @discardableResult?**
- ```
@discardableResult func createItem() -> Item {
    let newItem = Item(random: true)

    allItems.append(newItem)
}

return newItem
}
```
- C) With appropriate examples, explain creation and usage of designated initializer and convenience initializer.**

# Asha M. Tarsadia Institute of Computer Science and Technology

## Uka Tarsadia University

B.Tech. CSE (AI & ML)/CSE/CE/IT

### Internal Examination - 1

**Subject Name: AI4010 – Probability Models**

**Maximum Marks: 30**

**Date: 13/03/2024**

**Timing: 09:00 AM to 10.30 AM**

**General Instructions:**

1. Take appropriate assumptions whenever necessary.
2. Figures on the right indicate full marks allocated to the questions.
3. Attempt all the questions.

**Q-1 Answer the following in detail. (Any 2)**

**6**

- 1 In rolling a fare die what will be the probability of getting an even number?
- 2 In our day to day life, email communication plays pivotal role. However, the increase of spam emails poses a significant challenge for users. To address this issue Om Techno Solution Pvt. Ltd. hired Dr. Vasudev Krishnamurty as a cyber security analyst. Dr. Vasudev traced the email record of the company and found that the company received total of 1163896 emails amongst 38 percent emails is spam.

Given the scenario what will be the probability of a randomly selected email by Dr. Vasudev being non-spam email?

- 3 Mishra family has two children. What is the conditional probability that both are girls given that at least one of them is a girl?

**Q-2 Answer the following in detail. (Any 2)**

**12**

- 1 Suppose we have a dataset of 1000 patients who either have or do not have a particular disease. Each patient is described by a set of medical test results, and we want to build a machine learning model to predict whether a new patient has the disease or not. The Disease positive patients are 300 and Disease negative patients are 700. Let's assume we have a medical test for the disease, and the test results can be positive or negative. Probability that the test correctly identifies patients with the disease = 0.9 and Probability that the test correctly identifies patients without the disease = 0.8. Calculate the probability that the patient actually has the disease given the positive test result.
- 2 Suppose you flip a fare coin ten times. What is the probability of getting exactly seven heads? [Hint. The scenario follows Binomial distribution]
- 3 Explain Bernoulli random variable with necessary example.

**Q-3 Answer the following in detail. (Any 2)**

**12**

- 1 Sound Engineering Pvt. Ltd. manufactures headphones. Any headphone manufactured by the company will be defective with probability 0.1. What is the probability that in a sample of three headphones, at most one will be defective?

- 2 Suppose the presence of feature words "Basketball" and "Referee" recognizes the article of type Sports. Given the following data what is the probability that the new article is of type Sports given the words "Basketball" and "Referee"?
- a.  $N_{(Basketball, Referee), Sports} = 200$
  - b.  $N_{Sports} = 271$
  - c.  $N_{(Basketball, Referee)} = 301$
  - d.  $N_{(Basketball, Referee), Sports} = 487$
- 3 Suppose a basketball player has free throw success rate of 70%. What is the probability that it takes the player exactly 8 attempts to make their first successful free throw in a game? [Hint. The scenario follows Geometric distribution]

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### Internal Examination – 2

**Subject Name & Subject Code: Data Structures and Algorithms CE4015**

**Maximum Marks: 30**

**Date: 09/04/2024**

**Timing: 09:00 AM to 10.30 AM**

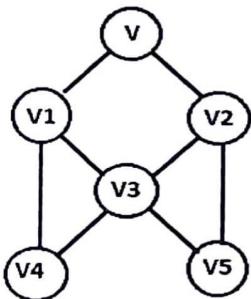
#### **General Instructions:**

1. Take appropriate assumptions whenever necessary.
2. Figures on the right indicate full marks allocated to the questions.
3. Draw Diagrams/Figures with pencil/black ink pen only.
4. Attempt all the questions.

**Q-1      Answer the following in detail. (Any 2)**

**6**

- 1 Determine DFS traversal for the graph mentioned below.



- 2 Discuss the properties of a red-black tree.

- 3 Explain greedy algorithms.

**Q-2      Answer the following in detail. (Any 2)**

**12**

- 1 Define space complexity and time complexity. Discuss Big O, theta and omega notations.
- 2 Explain divide and conquer approach with the suitable example.
- 3 Determine how many left and right rotations are required to construct the AVL tree for the given data: 35, 50, 40, 25, 30, 60, 78, 20, 28.

**Q-3      Answer the following in detail. (Any 2)**

**12**

- 1 Compare linear search with binary search. Illustrate the process to search 500 using binary search in the given sequence: 100, 140, 200, 395, 410, 452, 491, 500, 607
- 2 Consider the hash table of size 10 and the result of inserting keys {5, 18, 55, 78, 35, 15} using the hash function ( $f(key) = key \% 10$ ) using linear probing strategy.
- 3 What are the best case and the worst case time complexity of the quick sort? Apply quick sort to sort the following data: 35, 50, 15, 25, 80, 20, 90, 45

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### Internal Examination – 2

#### Subject Name: Operating System (CE 4016)

Maximum Marks: 30

Date: 09/04/2024

Timing: 02:00 PM to 03:30PM

#### General Instructions:

1. Take appropriate assumptions whenever necessary.
2. Figures on the right indicate full marks allocated to the questions.
3. Draw Diagrams/Figures with pencil/black ink pen only.
4. Attempt all the questions.

|            |                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q-1</b> | <b>Answer the following in brief. (Any 5)</b>                                                                                                                                                                                                                                                                                                                                                                                        | <b>10</b> |
| 1          | What is paging?                                                                                                                                                                                                                                                                                                                                                                                                                      |           |
| 2          | Describe the level two of file directories.                                                                                                                                                                                                                                                                                                                                                                                          |           |
| 3          | Explain techniques for performing I/O.                                                                                                                                                                                                                                                                                                                                                                                               |           |
| 4          | Draw the structure of disk.                                                                                                                                                                                                                                                                                                                                                                                                          |           |
| 5          | Define segmentation.                                                                                                                                                                                                                                                                                                                                                                                                                 |           |
| 6          | What are the attribute of file system?                                                                                                                                                                                                                                                                                                                                                                                               |           |
| <b>Q-2</b> | <b>Do as directed. (Any 4)</b>                                                                                                                                                                                                                                                                                                                                                                                                       | <b>20</b> |
| 1          | Consider the page reference string 2,0,3,0,4,2,3,0,3,2,7,2,0,7,5,0,7,5,7,0. Assume page frame size =3. Find out the algorithm having minimum page fault rate<br>i) FIFO    ii) LRU    iii) Optimal                                                                                                                                                                                                                                   |           |
| 2          | Explain the contiguous and non-contiguous memory allocation.                                                                                                                                                                                                                                                                                                                                                                         |           |
| 3          | Explain the disk read/write with and without DMA.                                                                                                                                                                                                                                                                                                                                                                                    |           |
| 4          | Consider a disk pack with the following specifications- 16 surfaces, 128 tracks per surface, 256 sectors per track and 512 bytes per sector. Answer the following questions- <ol style="list-style-type: none"><li>1. What is the capacity of disk pack?</li><li>2. What is the number of bits required to address the sector?</li><li>3. If the format overhead is 32 bytes per sector, what is the formatted disk space?</li></ol> |           |
| 5          | What is the file system in OS? Enlist types of file system.                                                                                                                                                                                                                                                                                                                                                                          |           |

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### Internal Examination – 2

#### **Subject Name& Subject Code: Advanced Web Development (IT4020)**

**Maximum Marks: 30**

**Date: 10/04/2024**

**Timing: 9:00 AM to 10:30AM**

#### **General Instructions:**

1. Take appropriate assumptions whenever necessary.
2. Figures on the right indicate full marks allocated to the questions.
3. Draw Diagrams/Figures with pencil/black ink pen only.
4. Attempt all the questions.

|            |                                                                                                                                                                                                 |           |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q-1</b> | <b>Answer the following in brief. (Any 5)</b>                                                                                                                                                   | <b>10</b> |
| 1          | Describe the methods of DOM event handlers.                                                                                                                                                     |           |
| 2          | What is the role of Blob API in handling binary data in web applications?                                                                                                                       |           |
| 3          | Discuss the structure of the DOM.                                                                                                                                                               |           |
| 4          | Describe the usage of the navigation object.                                                                                                                                                    |           |
| 5          | Explain the prop using an example.                                                                                                                                                              |           |
| 6          | State the purpose of the render() function.                                                                                                                                                     |           |
| <b>Q-2</b> | <b>Do as directed. (Any 4)</b>                                                                                                                                                                  | <b>20</b> |
| 1          | Explain the event flow with capturing and bubbling phases in the context of web development with appropriate examples.                                                                          |           |
| 2          | Design a scenario where a script form is utilized to create a registration form with a textbox and select box inputs, ensuring that user inputs are serialized and validated before submission. |           |
| 3          | Explain node type with an example.                                                                                                                                                              |           |
| 4          | Enlist and explain various browsers and rendering engines.                                                                                                                                      |           |
| 5          | Write a note on various phases of the React component lifecycle.                                                                                                                                |           |

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B.Tech. CSE/CE(SE)/CSE(Cloud Computing)/CSE(AI&ML)/CSE(CyberSecurity)/CE/IT  
(**4<sup>th</sup>Semester**)

**Subject :IT4021-Mobile Application Development with iOS  
Internal Examination-2**

Date: 10<sup>th</sup> April 2024

Max. Marks : 30

Time: 2 PM to 3.30 PM

### **Instructions:**

1. Attempt all questions.
  2. Follow usual meaning of abbreviations with respect to the subject.
  3. Make suitable assumptions wherever necessary.
  4. Figures to the right indicate full marks allocated to that question.

- Q-1 A)** With appropriate example and diagram explain "Content Hugging Priority" and "Content Compression Priority". [05]

OR

- A)** Write and explain Swift code to pass data from one view controller to another view controller using segue.

- B)** What is use of UINavigationController? Write steps to use UINavigationController in your application.

OR

- B)** What is `@IBInspectable`? Write Swift code and explain its use.

- Q-2 A)** What is "Archiving" and "Unarchiving"? Classes whose instances need [05]

- to be archived must conform to which protocol? Write Swift code snippet and explain "Archiving" and "Unarchiving" considering "Book" class.

OR

- A)** Write and explain steps with required code snippet to create custom UICollectionViewCell class and use it in ViewController.

- B)** Mr. Mahesh is working as iOS application developer in a software development company named "My Mobile App Solutions". Marketing manager of the company has received suggestion from customer to remember favorite greeting message of each user and provided list of greeting messages. Design and discuss your solution to remember favorite greeting message of each user using core data and greet the user with favorite message whenever app launches.

OR

- B)** With respect to core data deletion rule, explain use of "Cascade" and "Deny".

- Q-3** Answer following questions in detail. (Attempt any TWO) [2x5=10]

- A) What is the use of CocoaPods? Discuss advantages and limitations of using external libraries.
  - B) What is REST? Explain RESTful architecture and components of RESTful Web service.
  - C) What are Spacer( ) and Divider( ) in SwiftUI? Explain with appropriate example.

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B.Tech. CSE (AI & ML)/CSE/CE/IT

**Internal Examination - II**

**Subject Name: AI4010 – Probability Models**

**Maximum Marks: 30**

**Date: 12/04/2024**

**Timing: 09:00 AM to 10:30 AM**

**General Instructions:**

1. Take appropriate assumptions whenever necessary.
2. Figures on the right indicate full marks allocated to the questions.
3. Attempt all the questions.

**Q-1 Answer the following in detail. (Any 2)**

**12**

- 1 Explain Binomial distribution with the help of an appropriate example and necessary mathematical notations.
- 2 Suppose we have a biased coin that lands on heads with a probability of  $p = 0.6$  and tails with a probability of  $q = 1 - p = 0.4$  and  $X$  be a random variable representing the outcome of a single flip of the coin. Show the PMF and  $\text{Var}(X)$ .
- 3 Suppose a bank receives a new call every 10 minutes, on average. After a customer calls, find the probability that a new customer calls within 10 to 15 minutes.

**Q-2 Answer the following in detail. (Any 2)**

**12**

- 1 Explain joint distribution with an example.
- 2 Suppose an earthquake occurs every 100 days in a certain region, on average. After an earthquake occurs, find the probability that it will take more than 500 days for the next earthquake to occur.
- 3 Discuss discrete random vectors with its applications.

**Q-3 Answer the following in detail. (Any 1)**

**06**

- 1 Discuss Law of Large Numbers with an example.
- 2 Explain central limit theorem with its applications.

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CE4016(2022-23)/CE4016(2023-24)  
Operating Systems

Date :19/04/2024

Time :9:30AM- 12:30PM

Max. Marks:60

## Instructions :

1. Attempt all questions.
2. Write each section in a separate answer book.
3. Make suitable assumptions wherever necessary.
4. Draw diagrams/figures whenever necessary.
5. Figures to the right indicate full marks allocated to that question.
6. Follow usual meaning of notations/abbreviations.

## SECTION - 1

Q 1 Answer the following in Detail (Any 2) [6]

- I) Differentiate between monolithic, layered and microkernel structure of OS.
- II) Explain Shell. Explain use of chmod command in linux.
- III) What are the advantages of multiprogramming operating system.

Q 2 Answer the following in detail. (Any 2) [12]

- I) What is the function of a process scheduler? Explain the types of scheduler with diagram.
- II) Consider the following set of processes with the arrival times and the burst time given in milliseconds.

| Process | Arrival Time | Burst Time |
|---------|--------------|------------|
| P1      | 0            | 5          |
| P2      | 1            | 3          |
| P3      | 2            | 3          |
| P4      | 4            | 1          |

What is the average turnaround time and average response time for these processes with the preemptive shortest remaining time first and first come first serve algorithm.

- III) What is threading and multithreading? Explain importance of multithreading.

Q 3 Answer the following (Any 3) [12]

- I) Explain Deadlock system model in detail
- II) Assume that there are three resources, A, B, and C. There are 4 processes P0 to P3. At T0 we have the following snapshot of the system

|                | Allocation |   |   | Max |   |   | Available |   |   |
|----------------|------------|---|---|-----|---|---|-----------|---|---|
|                | A          | B | C | A   | B | C | A         | B | C |
| P <sub>0</sub> | 1          | 0 | 1 | 2   | 1 | 1 | 2         | 1 | 1 |
| P <sub>1</sub> | 2          | 1 | 2 | 5   | 4 | 4 |           |   |   |
| P <sub>2</sub> | 3          | 0 | 0 | 3   | 1 | 1 |           |   |   |
| P <sub>3</sub> | 1          | 0 | 1 | 1   | 1 | 1 |           |   |   |

- Is this the need matrix?
- Is the system in a safe state? Why or why not?

III) Discuss Bonded-Builder problem and Readers-Writer's problem in brief.

IV) Explain the dining philosopher's problem.

## SECTION - 2

**Q 4 Answer the following in Detail (Any 2)**

[6]

I) Discuss how to access file by different methods.

II) What is the need of file system? Explain various operations associated with files.

III) Define file system. What are the various components of file system?

**Q 5 Answer the following in detail. (Any 2)**

[12]

I) Write about Disk read-write using DMA.

II) Explain different disk space allocation methods.

III) Suppose that a disk drive has 200 cylinders from 0 to 199. The drive is currently at cylinder 53 and previous request at 43. The queue of pending requests in FIFO order is 98, 183, 37, 122, 14, 124, 65, 67. Starting from the current head position what is the total distance (in cylinder) that the disk arm moves to satisfy all the pending requests for each of the following disk scheduling algorithms: SSTF, SCAN, CLOOK, CSCAN.

**Q 6 Answer the following in detail. (Any 2)**

[12]

I) Consider the following page reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 0, 2, 0, 1, 7, 0, 1 with three frames. Calculate how many page faults occur for the following algorithm:i) FIFO ii) Optimal Page Replacement iii) LRU page replacement.

II) What is Paging? Explain paging mechanism in MMU with example.

III) Explain memory allocation algorithm in detail with example.

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CE4015(2023-24)  
Data Structures and Algorithms

Date :20/04/2024

Time :9:30AM- 12:30PM  
Max. Marks:60

## Instructions :

1. Attempt all questions.
2. Write each section in a separate answer book.
3. Make suitable assumptions wherever necessary.
4. Draw diagrams/figures whenever necessary.
5. Figures to the right indicate full marks allocated to that question.
6. Follow usual meaning of notations/abbreviations.

## SECTION - 1

Q 1 Answer the following in Detail (Any 2)

[6]

- I) Differentiate between data types and data structures.
- II) Answer the followings:
  - (1) Give examples of Linear and Non-Linear Data Structures.
  - (2) What do you mean by Abstract Data Types?
- III) Write short note on performance analysis and performance measurement of an algorithm.

Q 2 Answer the following in detail. (Any 2)

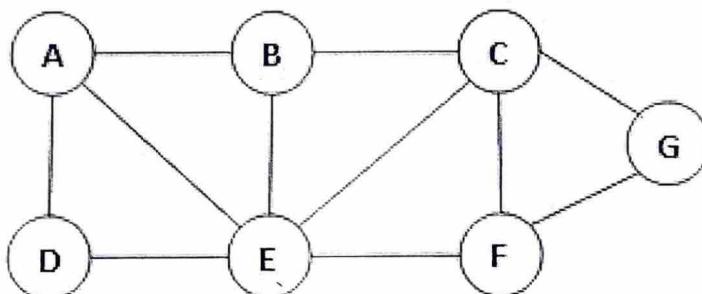
[12]

- I) What is stack? Explain operations on stack in detail.
- II) Design an algorithm to perform insert and delete operation in circular queue.
- III) Write an algorithm to insert a node in a Circular Link List at the end position.

Q 3 Answer the following in detail. (Any 2)

[12]

- I) Discuss each rotation of the AVL tree with a suitable example.
- II) Determine the BFS and DFS traversals for the graph mentioned below. Show the traces via appropriate data structure for respective traversal.



- III) Construct the binary search tree for the given data and determine the pre-order and in-order traversals for the tree.

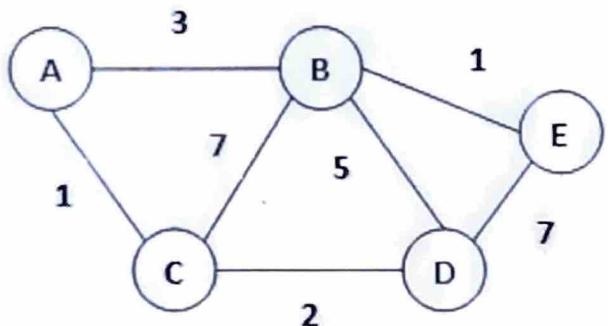
Data: 40, 25, 70, 22, 35, 60, 80, 90, 10, 30

## SECTION - 2

Q 4 Answer the following in Detail (Any 2)

[6]

- I) Discuss greedy algorithms with its significance.
- II) State the properties of red-black tree.
- III) Determine the shortest path to reach from a vertex A to D by applying Dijkstra's algorithm on a given graph.



**Q 5 Answer the following in detail. (Any 2)**

**[12]**

- I) What is time and space analysis? State and explain time analysis for linear search and binary search method.
- II) Explain Divide and Conquer in details.
- III) What is an algorithm? What are the properties of an algorithm?

**Q 6 Answer the following in detail. (Any 2)**

**[12]**

- I) Write an algorithm for selection sort.
- II) List out different hash methods and explain any three.
- III) Apply quick sort for the following data:  
9, 7, 5, 11, 12, 2, 14, 3, 10, 6

# UKA TARSADIA UNIVERSITY

B.Tech (Computer Engineering)/B.Tech (Information Technology)/B.Tech CE (Software Engineering)/B.Tech CSE/B.Tech CSE (AI&ML)/B.Tech CSE (Cloud Computing)/B.Tech CSE (Cyber Security) ( Semester 4 )  
IT4020(2022-23)/IT4020(2023-24)  
Advanced Web Development

Date :23/04/2024

Time :9:30AM- 12:30PM

Max. Marks:60

## Instructions :

1. Attempt all questions.
2. Write each section in a separate answer book.
3. Make suitable assumptions wherever necessary.
4. Draw diagrams/figures whenever necessary.
5. Figures to the right indicate full marks allocated to that question.
6. Follow usual meaning of notations/abbreviations.

## SECTION - 1

### Q 1 Answer the following in Detail (Any 2)

[6]

- I) What are the different ways of executing JavaScript in browser?
- II) Exemplify unary and bitwise operators using JavaScript.
- III) Explain iterative and reduction methods of an array.

### Q 2 Answer the following in detail. (Any 2)

[12]

- I) Explain object creation using a) Factory pattern, b) Function constructor pattern, and c) Prototype pattern.
- II) Using a demonstrative JavaScript implement inheritance using prototype chaining method.
- III) Using JavaScript, for an object named employee create a proxy object that will check the value of salary property to fall within a particular range. While setting a new value to the salary property, if the value is not within the range it will throw an error.

### Q 3 Answer the following in detail. (Any 2)

[12]

- I) Using JavaScript explain call() and apply() methods.
- II) Explain function closures using a JavaScript example.
- III) Describe Async function basics using JavaScript.

## SECTION - 2

### Q 4 Answer the following in Detail (Any 2)

[6]

- I) Explain methods used in initial render phase of React component life cycle.
- II) Write a note on React components.
- III) How do you pass props between components?

### Q 5 Answer the following in detail. (Any 2)

[12]

- I) Describe methods of internet explorer event handlers.
- II) Discuss the importance of removing event handlers. Explain a way to do the same.
- III) Explain BLOB API using an example.

### Q 6 Answer the following in detail. (Any 2)

[12]

- I) Enlist and explain object of BOM with appropriate methods and properties.
- II) Show the use of a rendering engine in a web browser to display web content using example.
- III) Explain node type with an example.

# UKA TARSADIA UNIVERSITY

B.Tech (Computer Engineering)/B.Tech (Information Technology)/B.Tech CE (Software Engineering)/B.Tech CSE/B.Tech CSE (AI&ML)/B.Tech CSE (Cloud Computing)/B.Tech CSE (Cyber Security) ( Semester 4 )  
IT4021(2022-23)/IT4021(2023-24)  
Mobile Application Development with iOS

Date :25/04/2024

Time :9:30AM- 12:30PM  
Max. Marks:60

## Instructions :

1. Attempt all questions.
2. Write each section in a separate answer book.
3. Make suitable assumptions wherever necessary.
4. Draw diagrams/figures whenever necessary.
5. Figures to the right indicate full marks allocated to that question.
6. Follow usual meaning of notations/abbreviations.

## SECTION - 1

Q 1 Answer the following.

[10]

- A) What makes mobile application development different? Discuss special development considerations.

OR

- A) List Swift collection types and explain any two with examples.

- B) What is view? With diagram explain view hierarchy in detail.

OR

- B) Explain the use of "Embed in Stack" and "Resolve Auto Layout Issues" of auto layout.

Q 2 Answer the following in detail. (Any 2)

[10]

- I) What is the use of UIImageView? Write code snippet and explain any two useful properties of it.

- II) Write Swift code and explain how to dismiss keyboard in iOS application.

- III) What are the responsibilities of view controller? Explain "Lazy Loading" with respect to view controller.

Q 3 Answer the following.

[10]

- A) With respect to table view, what are delegate and data source? Draw the diagram and explain relationship between them.

OR

- A) With appropriate examples, explain creation and usage of designated initializer and convenience initializer.

- B) Write Swift code for inserting and deleting row from UITableView.

OR

- B) Write code snippet and explain "customize appearance of UITableViewCell subclasses".

## SECTION - 2

Q 4 Answer the following.

[10]

- A) With appropriate example and diagram explain "Content Hugging Priority" and "Content Compression Resistance Priority".

OR

- A) Step by step explain how to dismiss the keyboard if user hits return key in TextField.

- B) How to use permissions in iOS application? Write steps for same.

OR

- B) With example, explain use of UIPanGestureRecognizer and UILongPressGestureRecognizer.

**Q 5 Answer the following.**

[10]

- A) Write and explain Swift code to delete an object from core data.

OR

- A) Which iOS application method will be called when application transit from "Inactive" state to "Active" State, "Suspended" state to "Not Running" State? Write Swift code snippet and explain use of those methods.

- B) Explain collection view layout object and its attributes with appropriate example.

OR

- B) Write and explain Swift code to retrieve instance of "Employee" class from core data.

**Q 6 Answer the following in detail. (Any 2)**

[10]

- I) What is the use of CocoaPods? Discuss two advantages and two limitations of using external libraries.
- II) What is REST? Explain RESTful architecture and components of RESTful Web service.
- III) Compare SwiftUI with UIKit and explain two major differences.

# UKA TARSADIA UNIVERSITY

B.Tech (Computer Engineering)/B.Tech (Information Technology)/

B.Tech CSE/B.Tech CSE (AI&ML)(Semester 4)

AI4010(2022-23)/AI4010(2023-24)

Probability Models

Date :27/04/2024

Time :9:30AM- 12:30PM

Max. Marks:60

## Instructions :

1. Attempt all questions.
2. Write each section in a separate answer book.
3. Make suitable assumptions wherever necessary.
4. Draw diagrams/figures whenever necessary.
5. Figures to the right indicate full marks allocated to that question.
6. Follow usual meaning of notations/abbreviations.

## SECTION - 1

**Q 1 Answer the following in Detail (Any 2)**

[6]

- I) If you roll two fair six-sided dice, what is the probability that the sum of the number rolled is 6?
- II) In our day-to-day lives, the increase in spam emails poses a significant challenge for users. To address this issue, some Tech firm has hired Dr. Radhika as a cyber security analyst. Dr. Radhika traced the email records of the company and found that the company received a total of 1,163,896 emails, among which 45 percent were categorized as spam. Given the scenario what will be the probability of a randomly selected email being non-spam email?
- III) Describe Independence with necessary mathematical notations.

**Q 2 Answer the following in detail. (Any 2)**

[12]

- I) Explain variance with an appropriate example and its significance.
- II) Explain continuous random variable along with its significance.
- III) Explain expectation of random variable with necessary mathematical notations.

**Q 3 Answer the following in detail. (Any 2)**

[12]

- I) Assume that, we have historical data on the daily temperatures in a city with a mean temperature of  $20^{\circ}\text{C}$  and a standard deviation of  $5^{\circ}\text{C}$ . Find a probability of a day having a temperature between  $15^{\circ}\text{C}$  and  $25^{\circ}\text{C}$ .
- II) Explain the concept of the lognormal distribution and its key characteristics. How does the lognormal distribution differ from the normal distribution?
- III) Explain Gamma distribution.

## SECTION - 2

**Q 4 A) Explain Chebyshev's inequality.**

[6]

OR

**Q 4 A) Discuss the LLN with its significance in data analysis.**

**Q 5 Answer the following in detail. (Any 2)**

[12]

- I) Explain conditional expectations with an appropriate example.
- II) Suppose we have data from a user's email inbox, recording the number of emails received per day over a certain period. On average, the user receives 15 emails per day. Find the probability that the given user received exactly 10 emails.
- III) Some manufacturing process is having average number of defective components produced per day is 4. What is the probability that this manufacturing process will produce exactly 3 defective components per day?

**Q 6 Answer the following in detail. (Any 2)**

[12]

Discuss jointly continuous random vectors.

I)

- II) A manufacturing facility produces electronic devices, and each device undergoes a quality control inspection before it is shipped to customers. The quality control process checks whether each device is defective or non-defective. Find a probability producing exactly 950 non-defective devices in a batch of 1000 devices.
- III) An IT company developing software functions and each function has a probability of 0.85 of being non-defective and a probability of 0.10 of being defective. Find the probability of producing fewer than 3 defective software functions.