डॉ.श्यामाप्रसाद मुखर्जी अंतरराष्ट्रीय सूचना प्रौद्योगिकी संस्थान
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Cyber Security and Digital Forensics

M.Tech II-Semester
B.Tech VI-Semester

Time : 150 Minutes

Max Marks: 50

Answer all the questions.

Part A

Answer All of the following questions   **10 x 2 = 20 M**

1. What is the difference between Public IP and Private IP?
2. Define Vulnerability.
3. What is meant by Zero Day Attack?
4. What are the elements of Information Security?
5. Define Imaging in Forensics. Explain its usage.
6. What is meant by Cyber Squatting, give example?
7. What happens in a phishing attack?
8. What is Cyber Security?
9. What is a Trojan Horse?
10. Explain two web-based attacks.

Part B

Answer All of the following questions   **5 x 6 = 30 M**

1. Explain any three vulnerabilities of OWASP Top 10 with example.
2. Mention any six activities as provided under section 43 of IT Act 2000.
3. Explain Collection, Examination, Analysis and Reporting of Digital Forensics Lifecycle.
4. A. Explain any three Cyber Crime Activities that are targeted to general public, with case study or example.

OR

B. Explain three attacks of Crime against Property with example.

5. A. Explain SQL Injection attack with relevant example, how to mitigate it.

OR

B. Explain Cross Site Scripting with relevant example, how to mitigate it.

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End-term Examinations   Data Structures & Algorithms

M.Tech, I-Semester   Time : 180 Minutes   Max Marks: 50

Instructions:

1. Write the Chapter and Question numbers while writing each Answer.
2. Write down the assumptions, if any, that are necessary for the correctness of the algorithms.
3. While writing algorithms, make sure to define the Inputs and Outputs carefully.
4. In each Chapter:
    a. There is a choice between the 1st and 2nd question. If you answer both, only first attempted will be evaluated.
    b. There is a choice between the 3rd and 4th question. If you answer both, only first attempted will be evaluated.

Chapter - 1

1. Briefly explain the classification of Data Structure. (2 marks)

OR

2. What is Big-Oh Notation? Explain. (2 marks)
3. Write algorithms and their time complexities to perform the following operations in a sorted Array: (8 marks)
    a. Insert an element ITEM.
    b. Delete an element ITEM.
    c. Search a given KEY.
    d. Modify a given KEY with new element ITEM.
    e. Remove Duplicate Elements.
    f. Union of 2 Arrays.
    g. Intersection of 2 Arrays.

OR

4. Write algorithms and their time complexities to perform the following operations in a Linked List: (8 marks)
    a. Insert an element ITEM: at beginning, and at end.
    b. Delete an element ITEM: from beginning, and from end.
    c. Search: a given KEY, and all elements larger than given KEY.
    d. Modify: a given KEY with new element ITEM.
    e. Print the middle Element ITEM.

Chapter - 2

1. Briefly explain the classification of Queue data structure. (2 marks)

OR

2. Explain 4 major differences between Stacks and Queues. (2 marks)
3. Write algorithm to convert an Infix Expression into Postfix Expression. Show how the algorithm works for "((A+B)/D)^((E-F)*(G+(H-I)+J))" (8 marks)

OR

4. Write algorithms to perform ALL the basic operations on the Circular Queues. (8 marks)

Chapter - 3

1. Briefly explain various ways of representing Binary tree with examples. (2 marks)

OR

2. Show each step to build a Binary Tree from the following: (2 marks)

MID Term Examination M.Tech. I SEMESTER OCTOBER AUTUMN 2024
Data Structure and Algorithms Analysis

M.Tech. I-Semester   **Time : 120 Minutes**   **Max. Marks : 50**

1. **Attempt any 03 from the following 04 questions: (2x3=6 marks)**

   a. What are the characteristics of data structure.
   b. Explain Linear search, with its time complexities for various cases.
   c. Explain Binary search, with its time complexities for various cases.
   d. Compute time complexity for the following code snippet:
      i. for (i=1 ; i<=n ; i+=2)
      ii.   { for (j=1 ; j<=n ; j=2*j)
      iii.   {   for (k=1 ; k<=n ; k+=k)
      iv.   {   printf("*"); } } }

2. **Attempt any 01 from the following 02 questions: (1x4=4 marks)**

   a. Array Vs. Linked List.
   b. Linear Vs Non-Linear data structures.

3. **Attempt any 04 from the following 05 questions: (4x10=40 marks)**

   a. What is Asymptotic notation? Explain the types of Asymptotic notation in detail with example.
   b. What is Row-Major and Column-Major Order Addressing? If the array A[-13..55][19..153] of 32-bit unsigned integers is stored in Row-Major Order, then the address of A[3][51] is 5108. What are the addresses of A[45][103], A[26][71] and A[-3][51], if stored in Column-Major Order?
   c. Write the differences between Singly LL, Doubly LL, Circular Singly LL and Circular Doubly LL.
   d. Explain Quick sort with algorithm and example, and its best-case & worst-case time complexity. Also write its advantages and disadvantages.
   e. Sort the array [24, 56, 47, 35, 10, 90, 82, 31] by using:
      i. Bubble sort.
      ii. Selection sort.
      iii. Bucket sort.
      iv. Merge sort.
   Show the changes that occur in each pass.