Graphic Era HILL UNIVERSITY
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End Term (Odd) Semester Examination December 2024

Roll no. 2492525

Name of the Course and semester: BCA / BCA (AI & DS) I semester
Name of the Paper: Computational thinking and fundamentals of IT
Paper Code: TBC 101 / TBD 101

Time: 3 hour Maximum Marks: 100

Note:

(i) All the questions are compulsory.
(ii) Answer any two sub questions from a, b and c in each main question.
(iii) Total marks for each question is 20 (twenty).
(iv) Each sub-question carries 10 marks.

Q1. (2X10=20 Marks) CO 1

a. What is the importance of computational thinking in problem-solving? List the different data types in computational thinking.

b. Explain general problem-solving techniques with examples.

c. Write a brief note on pseudo code. Write pseudo code for calculating the average of three numbers provided by the user.

Q2. (2X10=20 Marks) CO 2

a. Describe the characteristics of an algorithm with suitable examples. Write an algorithm for calculating the factorial of a given number.

b. Explain the significance of flowchart symbols with examples. Draw a Flowchart to find the largest among three numbers provided by the user.

c. Explain Sequential, Branching and Looping in flowchart with one example of each.

Q3. (2X10=20 Marks) CO 3

a. Describe the functional units of a computer system in detail with a block diagram.

b. (i) what is the difference between first and second-generation computers?
(ii) Briefly describe the role of I/O devices in a computer system. With example

c. Explain the classification of computers with suitable examples.

Q4. (2X10=20 Marks) CO 4

a. Define the role of RAM and ROM in a computer system. How do they differ in functionality? Differentiate between PROM, EPROM, and EEPROM.

b. Define System Software. Discuss the objectives and functions of an Operating System.

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c. Compare the following programming paradigms:
(a) Machine Language
(b) Assembly Language
(c) High-Level Language

Q5. (2X10=20 Marks) CO 5

a. Do the following.

i. Convert $(101101)_2$ to decimal, octal and hexadecimal.
ii. Convert $(7F3)_{16}$ to binary and decimal.
iii. Convert Binary code (1101) to Gray code.
iv. Convert decimal number (657) to BCD.

b. (i)Find 1's and 2's complement of the following number.
(a) 10110 (b) 10111

(ii) Define data communication. Explain the types of data communication. Provide a practical example for each.

c.(i) Differentiate between Local Area Networks (LANs), Metropolitan Area Networks (MANs), and Wide Area Networks (WANs) with examples.
(ii) What are network protocols? Why are they essential in data communication? Name some commonly used network protocols.