

B.Sc.- III (Information Technology) CBCS Pattern Semester-V
007 - Elective-I - Paper-III : Data Structures

P. Pages : 2

Time : Three Hours



GUG/W/23/13134

Max. Marks : 40

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- Notes :
1. All questions are compulsory and carry equal marks.
 2. Draw labelled diagram and use supporting data wherever necessary.
 3. Avoid vague answers and write specific answers related to questions.

Either:

1. a) Explain any two operations of Data structure in detail. 4
- b) Write an algorithm to find total positive and negative among any five members. 4

OR

- c) Define Sorting Explain insertion sort. 4
- d) What is Merge Sort? Give its advantages. 4

Either:

2. a) Define and explain various operations on stack. 4
- b) Translate the following infix expression into its equivalent prefix. 4
 - i) $A/B^C + (D * E) - (A * C)$
 - ii) $A + ((B * C) - (D / E * F)) * G * H$

OR

- c) What is Queue? Write down its applications in detail. 4
- d) Write an algorithm to check the status of Queue. 4

Either:

3. a) Define Recursion. Write down its advantages and disadvantages. 4
- b) Write an algorithm to find the sum of first n natural numbers. 4

OR

- c) Illustrate the concept of tower of Hanoi in detail. 4
- d) Write an algorithm to find the reverse of string using recursion. 4

Either:

4. a) Write an algorithm to traverse a binary tree in post-order. 4
- b) Explain the term- 4
- i) Binary tree ii) Path

OR

- c) Define Graph. Explain any two terminologies in graph. 4
- d) What do you mean by Spanning Tree? Explain detail. 4
5. Solve all the questions.
- a) Write a note on Array. 2
- b) Explain the significance of Top in stack. 2
- c) Write a short note on Single Linked List. 2
- d) Explain Directed graph in detail. 2
