

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

P. Pages : 2

Time : Three Hours



**GUG/W/24/13134**

Max. Marks : 40

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

**Either:**

1. a) Define Data structure. List and explain the various operations on data structure. 4
- b) Write a algorithm to insert an element ITEM into the k<sup>th</sup> position in linear array. 4

**OR**

- c) Explain the memory representation of two dimensional array. 4
- d) What is sorting? Explain the concept of bubble sort in detail. 4

**Either:**

2. a) Define Queue. Give the representation of simple queue. 4
- b) Write an algorithm to pop an item from stack. 4

**OR**

- c) What is stack? List and explain the basic operations on stack. 4
- d) Write an algorithm to insert an item in a circular queue. 4

**Either:**

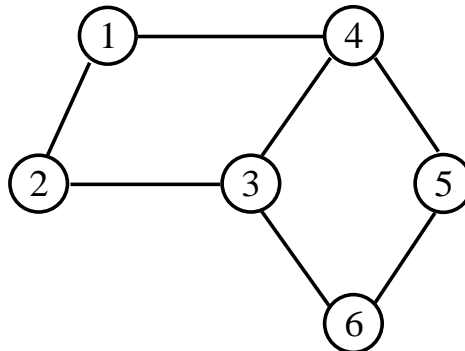
3. a) What is linked list? Explain in detail. 4
- b) Write an algorithm to multiply two numbers using recursion. 4

**OR**

- c) What is the concept of tower of Hanoi. Explain with suitable diagrams. 4
- d) Write an algorithm to traverse a linked list. 4

**Either:**

4. a) What is Binary Tree? Explain Binary search tree in detail. 4
- b) Draw the various spacing trees for following. 4



**OR**

- c) What is path matrix? Explain with suitable example. 4
- d) Write a note on: 4
- i) AVL Tree.
  - ii) Expression Tree.
5. Solve all the questions.
- a) Explain linear search in detail. 2
- b) Write a note on: 2
- i) Prefix.
  - ii) Postfix.
- c) Give the advantages and disadvantages of recursion. 2
- d) Define 2
- i) Strongly conned graph.
  - ii) Indegree.

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