24 Feb 23

1483/III

B.C.A. (Part-II) EXAMINATION, 2022-23

(Third Semester)

9227

(BCA 303 : DATA STRUCTURE)

Paper : III

Time : Three Hours] [Maximum Marks :70

Note: **(i)** Answer **Five** Questions in all.

(ii) Question **No. 1** is compulsory.

(iii) Answer remaining **four** questions, selecting **two** from each Section **A** and **B**.

(iv) All questions carry equal marks.

1. Answer all parts of the following in brief:

(a) Differentiate between Primitive and Non Primitive data structure.

(b) Consider A[5____50], base address 300, size of element is 4 byte. Then find the address of A[15].

(c) Describe the application of Array.

(d) Define Stack and its features.

Section-A

2. What is Sparse Matrix in Data Structure? Explain Sparse Matrix representation with suitable examples.

3. Write Infix to Postfix Algorithm and Convert the following from Infix to Postfix using Stack-

$$a + (b + c * d + e) + f/g$$

4. Solve the following Queue operation step by step using array representation, where array size is 5.

   (i) empty,

   (ii) insert A, B, C

   (iii) delete A,

   (iv) insert D, E

   (v) delete B, C

   (vi) insert F

   (vii) delete D

   (viii) insert G, H

   (ix) delete E

   (x) delete F

   (xi) insert K

(xii) delete G, H

(xiii) delete K

5. What do you mean by Polynomial representation in Linked List? Also perform the Addition of polynomial expression using Linked list –

$$p(1) = 13x^8 + 7x^5 + 32x^2 + 54$$

$$p(2) = 3x^{12} + 17x^5 + 3x^3 + 98$$

Section-B

6. (a) Given Matrix A[4][5], base address 1020, size of element 2 byte, find the address of A[3][4], using row major and column major representation.

(b) Explain generalized linked list. Perform the following operation using generalised linked list:

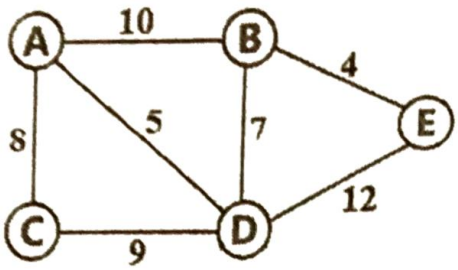
$$p, q(r, s(t, u, v)\ w)x, y)$$

7. (a) Write Prim's Algorithm with suitable examples.

(b) What is searching? Explain Linear Search with algorithm and suitable examples.

8. (a) Explain Binary Tree. Discuss various types of Binary Tree.

(b) Write down Graph Representation in memory. Perform the Operation in following undirected weighted graph using sequential representation (2D-Array).



9. Write notes on any two of the following:

(a) Terminologies of Graph

(b) PUSH and POP Algorithm.

(c) Difference between Array and Linked List.

••••