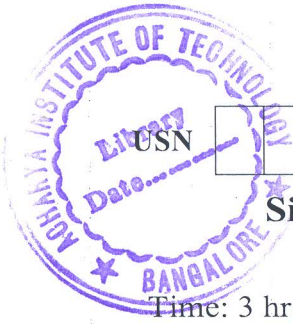


CBCS SCHEME

15EC661



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Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Data Structures Using C++

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What are template functions? Write a program to explain template functions. (05 Marks)
- b. What is a linear list? List various operations on Linear list. (05 Marks)
- c. Discuss Array Mapping? Map the list [5, 2, 4, 8, 1] using formulae i) location (i) = i ii) location (7+i)%10. With array length = 10. (06 Marks)

OR

- 2 a. Explain how new and delete operators are used for dynamic memory allocation. (05 Marks)
- b. What do you mean by Array Doubling? Write a program to double the length of an array. (05 Marks)
- c. What are singly linked lists? Explain Remove and Insert operations with respect to singly linked lists. (06 Marks)

Module-2

- 3 a. Discuss the need for Row and column mapping. Explain with example. (05 Marks)
- b. What are sparse matrices? Give the linear list representation or the same. (05 Marks)
- c. Describe Towers of Hanoi problem and give the solution for the same. (06 Marks)

OR

- 4 a. Write a program to perform matrix addition and multiplication. (07 Marks)
- b. What are special matrices? Explain the examples. (09 Marks)

Module-3

- 5 a. Discuss the nature of the Queue and explain queue mapping using arrays. (05 Marks)
- b. Describe Railroad car Re-arrangement problem and derive the solution for the same. (06 Marks)
- c. What is a dictionary? Discuss various operations on dictionaries. (05 Marks)

OR

- 6 a. With a simple example, explain Array representation of queues. (05 Marks)
- b. Write a method for 'push' and 'pop' for linked queue. (05 Marks)
- c. With a real life example, explain Ideal Hashing. (06 Marks)

Module-4

- 7 a. Define Tree? Explain tree with real world example. (06 Marks)
- b. Write a program for i) Pre order traversal ii) In order traversal iii) Post order traversal iv) level order traversal and explain. (10 Marks)

OR

- 8 a. What are binary trees? Explain various properties of binary trees. (08 Marks)
- b. Describe Abstract data type → Binary tree and derived class linked binary tree with code. (08 Marks)

Module-5

- 9 a. Give real life example to explain priority queue. (08 Marks)
- b. Define a binary search tree and explain properties of binary search tree. (08 Marks)

OR

- 10 a. Define Heap. Explain insert and delete operations using max.heap. (08 Marks)
- b. Explain Heapsorting application and write a program for the same. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.