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10MT65

Sixth Semester B.E. Degree Examination, Feb./Mar. 2022
Advanced Computer Programming

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO full questions from each part.***

PART – A

1 a. With respect to classes, briefly explain the following with an example for each.
i) Construction function ii) Destructor function
iii) Constant function iv) Copy constructor **(10 Marks)**

b. Give the linked representation of a linear list (or chain) and further indicate the class definition for a chain. **(10 Marks)**

2 a. Show the Abstract Data Type (ADT) specification of an array, with an illustrative example. **(06 Marks)**

b. Write the program for matrix multiplication in C++. **(08 Marks)**

c. What do you mean by spare matrix? Give the class sparse matrix program that uses a row – major mapping. **(06 Marks)**

3 a. Write the ADT for stack class. **(04 Marks)**

b. Develop a program that defines a linked stack derived from the class chain. **(06 Marks)**

c. Write a program to output matched parentheses Trace the program for the following expression (d+(a+b)*c* (d+e) – f) (c) **(10 Marks)**

4 a. Define queue. Explain circular queue with example. **(04 Marks)**

b. What are the two methods of representing a queue? Explain linked representation. **(08 Marks)**

c. Explain the following in detail: i) Rail road car rearrangement ii) Wire routing. **(08 Marks)**

PART – B

5 a. What is a dictionary? Explain the various operation performed on dictionaries with example. **(08 Marks)**

b. Explain skiplist representation, with an example. **(06 Marks)**

c. Write a short note on Hash functions and tables. **(06 Marks)**

6 a. Define tree. Explain elements of tree. **(04 Marks)**

b. Explain binary tree traversals and its operation. **(06 Marks)**

c. Construct binary expression trees corresponding to following expression:
i) (a * b) + (c / d) ii) ((a + b) + c) + d iii) ((–a) + (x + y)) / ((+b)*(c * a)) **(10 Marks)**

7 a. Define priority queue. Write abstract data-type priority queue. **(06 Marks)**

b. Create a heap for given list : 20, 12, 35, 15, 10, 80, 30, 17, 2, 1 **(10 Marks)**

c. Write short notes on leftist list. **(04 Marks)**

8 a. Explain the following :
i) Binary search tree ii) M-way search tree iii) B-tree of order m. **(06 Marks)**

b. Write a program for insertion operation of binary search tree. **(08 Marks)**

c. Write abstract data-type specification of binary search tree. **(06 Marks)**

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