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Question Paper Code: 53827

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2019

Third Semester

Biomedical Engineering

15UIT327-OBJECT ORIENTED PROGRAMMING AND DATA STRUCTURES

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. In C++, the default access specifier in class is _____. CO1- U
(a) Public (b) Protected (c) Private (d) Friendly
2. What happens when we try to compile the in following code snippet? CO2 Ana

```
class Birds {};  
class Peacock : protected Birds {};
```

(a) It will not compile because a class cannot be protectedly inherited from other class..
(b) It will not compile because class body of Peacock is not defined
(c) It will not compile because class body of Birds is not defined
(d) It will compile successfully
3. What is the time complexity to insert a node based on key in a priority queue? CO3- U
(a) $O(n^2)$ (b) $O(n)$ (c) $O(\log n)$ (d) $O(n \log n)$
4. What is/are the disadvantages of implementing tree using normal arrays? CO4-U
(a) difficulty in knowing children nodes of a node
(b) difficult in finding the parent of a node
(c) have to know the maximum number of nodes possible before creation of trees
(d) difficult to implement
5. What is the speciality about the in order traversal of a binary search tree? CO5- U
(a) It traverses in an increasing order (b) It traverses in a non increasing order
(c) It traverses in a random fashion (d) It traverses based on priority of the node

PART – B (5 x 3= 15 Marks)

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|-----|--|--------|
| 6. | Compare constructor and destructor. | CO1- U |
| 7. | Define virtual function. Mention its advantages. | CO2- U |
| 8. | Compare circular and double ended queues. | CO3- U |
| 9. | Write the various transformations performed in AVL tree. | CO4- U |
| 10. | Mention some methods for choosing the pivot element in quick sort. | CO5- U |

PART – C (5 x 16= 80Marks)

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| 11. | (a) | (i) Define token in C++. Explain its various types with examples. | CO1- U | (12) |
| | | (ii) List the operators of C++ that cannot be overloaded. | CO1- U | (4) |
| | | Or | | |
| | (b) | Define a class BOOK with the following specifications :
Private members of the class BOOK are
BOOK_NO integer type
BOOKTITLE 20 characters
PRICE float (price per copy)
TOTAL_COST float
Public members of the class BOOK are
INPUT() - function to read BOOK_NO, BOOKTITLE, PRICE
PURCHASE() - function to ask the user to input the number of
copies (int n) to be purchased. It calculates TOTAL_COST
(PRICE *n) and prints the total cost to be paid by the user.
Create an object for accessing the members using C++. | CO1 App | (16) |
| 12. | (a) | Define inheritance. Explain the various types of inheritance with
example programs. | CO2-U | (16) |
| | | Or | | |
| | (b) | (i) Explain the functions seekg, seekp, tellg, tellp used for
setting pointers during file operation. | CO2-U | (8) |
| | | (ii) Write a program containing a possible exception. Use a try
block to throw it and a catch block to handle it properly. | CO2-U | (8) |
| 13. | (a) | (i) How will you analyze an algorithm? Explain | CO3-U | (8) |
| | | (ii) Explain the implementation of list operations using array. | CO3-U | (8) |

Or

- (b) (i) Consider an Array [1:n] Given a position, write an algorithm to insert an element in the array. If the position is empty, the element is inserted easily. If the position is already occupied, the element should be inserted with the minimum number of shifts. (Note: the elements can shift to the left or the right to make the minimum number of moves) CO3-U (8)
- (ii) Explain the properties of heaps. CO3-U (8)
14. (a) (i) Construct the binary tree for the following. CO4-U (8)
In order : 3 5 6 8 12 15 18 19 Preorder: 12 5 3 6 8 18 15 19
- (ii) Write kruskal's algorithm for finding minimal spanning tree of any graph. CO4-U (8)
- Or
- (b) (i) Explain Dijkstra's algorithm for finding shortest path. CO4- U (8)
- (ii) Define graph. Explain the depth first search tree. CO4- U (8)
15. (a) Explain the following collision resolution strategies with example. CO5- U (5)
- (i) Separate Chaining
- (ii) Linear Probing CO5- U (5)
- (iii) Quadratic Probing CO5- U (6)
- Or
- (b) Sort the given integers and show the intermediate results using insertion sort and bubble sort. 35,12,14,9,15,45,32,95,40,5. CO5- U (16)

