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**Question Paper Code : 52857**

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Third Semester

Computer Science and Engineering

CS 6301 – PROGRAMMING AND DATA STRUCTURES – II

(Common to: Information and Technology)

(Regulation 2013)

(Also common to PTCS 6301 – Programming and Data Structures II for B.E.  
Part-time - Second Semester – Computer science and Engineering – Regulation 2014)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define an object. Give an example.
2. What is 'this' pointer in C++?
3. State the use of operators 'new' and 'delete' in C++.
4. Define inheritance. Give its types.
5. What is an abstract class? Give an example.
6. What is an exception Handling. Give an example.
7. What is a nonlinear data structure? Give an example.
8. What are disjoint sets? Give an example.
9. Define Euler path and Euler circuit of a graph.
10. What is a minimal spanning tree? Give an example.

PART B — (5 × 13 = 65 marks)

11. (a) (i) Outline abstraction and encapsulation with an example. (6)  
(ii) Explain the storage classes in C++. (7)

Or

- (b) (i) Write a C++ program to print the first 'n' prime numbers. (6)  
(ii) Write a C++ program to accept a square matrix, find the transpose and print the result. Use classes and member functions. (7)

12. (a) Write a C++ program to sort an array of 'N' names in alphabetic order. (13)

Or

- (b) (i) Explain dynamic memory allocation in C++ with code snippets. (7)  
(ii) What is polymorphism? Outline compile time polymorphism and runtime polymorphism with an example. (6)

13. (a) Explain exception handling in C++ with an example. (13)

Or

- (b) What is a template? Explain class template and function template with C++ code. (13)

14. (a) What is an AVL tree? Illustrate the steps in the algorithm for inserting a node into an AVL tree with an example. (13)

Or

- (b) What is a splay tree? Illustrate the steps in the algorithm for deleting a node from a splay tree with an example. (13)

15. (a) Explain the algorithm for breadth-first search traversal of a graph with an example. (13)

Or

- (b) Outline the steps in the Dijkstra's single-source shortest path algorithm with an example. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Construct a B.- tree of order 5 for the following key values: 1, 12, 8, 2, 25, 6, 14, 28, 17, 7, 52, 16, 48, 68, 3, 26, 29, 53, 55 and 45. Illustrate the tree construction process step by step. (15)

Or

- (b) Apply the Kruskal's algorithm to find the minimal spanning tree for the following graph: (15)



