Reg. No. : | E | N | G | G | T | R | E | E | . | C | O | M |

Question Paper Code : 60004

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2022.

Second Semester

Computer Science and Business System

AD 3251 – DATA STRUCTURES DESIGN

(Common to : Artificial intelligence and Data Science)

(Regulations 2021)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the difference between ADT and data structure?

2. What are the types of Analysis of Algorithms?

3. Give some examples for linear structures.

4. Differentiate stack ADT and queue ADT.

5. Mention any two sorting algorithms with their best time complexities

6. How do you differentiate external and internal sorting?

7. What is the main property of a binary tree?

8. What is the advantage of using multi-way search tree?

9. What are the various ways of representing a graph?

10. What do you meant by DAG?

PART B — (5 × 13 = 65 marks)

11. (a) List out all Object Oriented Programming (OOPs) Concepts and explain in detail.

Or

(b) Explain about asymptotic notations and their role in algorithmic analysis.

12. (a) List out and explain various operations of linked list.

Or

(b) What is a Deque? Explain its types and its operations with diagramatic representation.

13. (a) Explain the process of selection sort with an example.

Or

(b) Explain briefly about Hash Table Collision Handling.

14. (a) What is the use of traversal? Explain about Tree traversal in data structures.

Or

(b) What is Heap? How to build a max heap and min heap?

15. (a) Define Graph. List down various graph traversal algorithms. Explain any one in detail.

Or

(b) Give brief notes on shortest path problem, shortest path algorithms and its application.

PART C — (1 × 15 = 15 marks)

16. (a) Do a comparative analysis on singly linked list, doubly linked list and circularly linked list with suitable diagrams and suggest some applications for each.

Or

(b) What is the search mechanism you would recommend to search a students where students are organized based on their DOB? Justify. Write and explain the algorithm of your recommended.

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