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# Question Paper Code : 31297

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Third Semester

Computer Science and Engineering

CS 2201/CS 33/10144 CS 302/080230007 — DATA STRUCTURES

(Regulation 2008/2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define a linear and non linear data structure. Give an example for each.

2. What is an abstract data type? Give an example.

3. Convert the expression ((A + B) * C – (D – E) ^ (F + G)) into its equivalent Postfix notation.

4. Define a full binary tree. Give an example.

5. What is a heap?

6. List any two applications of binary heap.

7. What is rehashing?

8. List any two applications of set.

9. What are Euler circuits?

10. What is a spanning tree?

PART B — (5 × 16 = 80 marks)

11. (a) Develop an algorithm to implement a Stack ADT. Give relevant example and diagrammatic illustrations. (16)

Or

(b) Develop an algorithm to implement a Doubly Linked List. Give relevant example and diagrammatic illustrations. (16)

12. (a) List the different types of Tree Traversal. Develop an algorithm for traversing a Binary Tree. Validate the algorithm with a suitable example. (16)

Or

(b) Develop an algorithm to implement a Threaded Binary Tree. Validate the algorithm with a suitable example. (16)

13. (a) Develop an algorithm to implement an Splay Tree. Validate the algorithm with a suitable example. (16)

Or

(b) Develop an algorithm to implement a Binary Heap. Validate the algorithm with a suitable example. (16)

14. (a) State the dynamic equivalence problem. With a procedure and an example discuss the dynamic equivalence problem. (16)

Or

(b) With a procedure and a relevant example discuss separate chaining in hashing. (16)

15. (a) Develop an algorithm to compute the shortest path using Dijkstra's algorithm. Validate the algorithm with a suitable example. (16)

Or

(b) Develop an algorithm to find the minimal spanning tree using Prim's algorithm. Validate the algorithm with a suitable example. (16)