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**Question Paper Code : X 60372**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020

Third Semester

Computer Science Engineering

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

(Regulations 2008/2010)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. What are the advantages of linked list over arrays ?
2. List the applications of stack.
3. Write the algorithm for pre-order traversal.
4. What are threaded binary trees ? Give its advantages.
5. What is a heap ?
6. List any two applications of binary heap.
7. Define the approach Union-By-Size.
8. State the advantages of collision resolution strategies.
9. Define critical path.
10. What is weakly connected graph ?



- 11. a) i) Explain the operations of queue with C function. (8)
- ii) Explain the array implementation of stacks. (8)

(OR)

- b) Explain the cursor implementations of linked list. (16)

- 12. a) Write a C program to visit the binary tree using various tree traversals. (16)

(OR)

- b) i) Simulate a dictionary consisting of terminologies and their meanings (Key/Value pairs) with suitable search operations using binary search tree. (10)
- ii) Explain Huffman coding with a suitable example. (6)

- 13. a) Show how to implement the merge operation on splay trees so that a sequence of n-1 Merges starting from n single-element trees takes  $O(n \log^2 n)$  time. (16)

(OR)

- b) Implement Fibonacci heaps and compare their performance with binary heaps when used in Dijkstra's algorithm. (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) Write procedure to perform topological sort and explain. (16)

(OR)

- b) Construct minimum spanning tree for the following graph using Prim's and Kruskal's algorithm. (16)

