BIM / Third Semester / IT 238: Data Structure and Algorithms

Candidates are required to answer the questions in their own words as far as practicable.

Brief Answer Questions:

- 1. Define computational complexity.
- 2. Distinguish between array list and linked list.
- 3. What is part of pop operation in stack?
- 4. List any one limitation of circular queue.
- 5. What is indirect recursion?
- 6. Define binary tree.
- 7. List any one different between graph and tree.
- 8. What is the role of pivot element in quick sort?
- 9. Why do we need hashing?
- 10. Define max heap.

Group "B"

Short Answer Ouestions: (Attempt any FIVE Ouestions)

- 11. Do we need to analyze the average case as asymptotic notation? Justify.
- 12. Evaluate 32 + 6*4 using stack.
- 13. Construct AVL trees for 22, 27, 31, 10, 515.
- 14. Discuss about B tree as a self-balancing tree.
- 15. Write an algorithm or function to enqueue an element into a linear queue.
- 16. Write a recursive function to reverse the given integer.

Group "C"

Long Answer Questions: (Attempt any THREE Questions)

- 17. Assume a 10-size hash table onto which insert 17, 19, 36, 7, 25, 6, 42 using quadratic probing.
- 18. Write an algorithm or function to search a data item in a Binary Search Tree.
- 19. Write a Java function to delete first and last node of a circular linked list.
- 20. Create a B-tree of order 5 with given data: 5, 8, 2, 7, 6, 15, 1, 12, 4, 13, 3.

[10×1=10]

[5×3=15]

[3×5=15]

Group "A"

Full Marks: 60 Pass Marks: 30 Time: 3 Hrs.

Group "D"

Comprehensive Answer / Case / Situation Analysis Questions:

- 21. Why we need to sort data? Trace it to sort the given data using heap sort algorithm: 12, 18, 16, 11, 20, 25, 13, 22, 21.
- 22. Define spanning tree. Draw a minimum spanning tree using Kruskal's algorithm and prims algorithm for the graph below:



[2×10=20]