Roll No. | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 18

B.Tech. (IT) (2018 Batch) (Sem.–4)

DESIGN & ANALYSIS OF ALGORITHMS

Subject Code : BTIT-403-18

M.Code : 77540

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Answer briefly :

1. How to measure an algorithm's running time?
2. What do you mean by "*worst case efficiency of an algorithm*"?
3. Differentiate between graph and tree.
4. What is minimal spanning tree?
5. Give an example of dynamic programming approach.
6. What are the graph traversal techniques?
7. State approximation technique.
8. Give an example of dynamic programming approach.
9. Differentiate between time efficiency and space efficiency.
10. What is flow network?

SECTION-B

11. Write a short note on greedy strategy to solve a problem.

12. Solve the following problem by using least cost branch and bound method :

    Knapsack instance n = 4, p(1:4) = {1,1,12,18} and

    Weight w (1:4) = (2,4,6,9) & max capacity m =15

13. What is the relationship among P, NP and NP complete problems? Show with the help of a diagram.

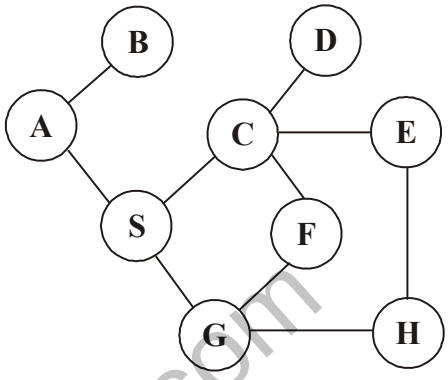

FIG.1

14. Traverse all the vertices of above figure using breadth first search.

15. Find the adjacency list and adjacency matrix of below figure.

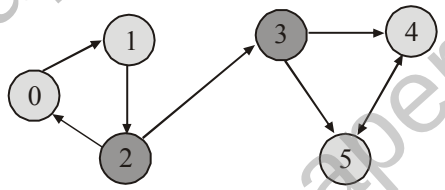

FIG.2

SECTION-C

16. Explain the advantages of using dynamic programming. Introduce travelling salesman problem. Explain the technique to solve travelling salesman problem using this technique.

17. Why do we perform topological sorts only on directed acyclic graph? Explain

18. Discuss Heuristics and its characteristic.