SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
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QUESTION BANK (DESCRIPTIVE)

Subject with Code : ADVANCE ALGORITHMS (18CS5003) **Course & Branch**: M.Tech – CSE

Year & Sem: I-M.Tech & II-Sem **Regulation:** R18

UNIT-I

SORTING & GRAPHS

1.What is Topological sorting?Illustrate topological sorting with algorithm [12M]

2.Discuss any two exchange sorting techniques with algorithm [12M]

3.Differentiate graph traversing techniques with algorithm [12M]

4.What is minimum cost spanning tree?Write algorithm for kruskals technique with Illustration [12M]

5.write sequence of steps to find shortest path using Dikstra's technique with an example [12M]

6. Illustrate below graph traversing techniques with algorithm

a)Breadth first search [6M]

b)Depth first search [6M]

7.Narrate sorting techniques using "divide and conquer approach [12M]

8.Describe about Asysmptotic notations [12M]

9.Write about following

a)Diminishing increment sort [6M]

b)sorting using linked list [6M]

10.Compare and Illustrate different "minimum cost spanning tree" finding algorithms [12M]

UNIT-II

MATROIDS & GRAPH MATCHING

1.What is matroid?Illustrate any two greedy algorithm techniques [12M]

2.Write algorithm to compute maximum weight and minimal independent set [12M]

3.Illustrate prims technique with algorithm [12M]

4.Write an algorithm to find out maximum matching in graphs [12M]

5.What is augmenting path?How it is computed with Edmonds Blossom Algorithm [12M]

6.Narrate few applications of spanning trees with example [12M]

7.write about following

a)warshall's technique [6M]

b)Graph colouring problem [6M]

8.Narrate following in detail

a)Huffman coding and compression [6M]

b)Travelling sales person problem [6M]

9.Illustrate any three graph applications with algorithms [12M]

10.Discuss the difference between following

a)Chromatic numbers in scheduling [6M]

b)Directed acyclic graphs in planning activities [6M]

UNIT – III

FLOW NETWORKS &MATRIX

1.Explain following

a)Maxflow-mincut theorem [6M]

b)Ford-Fulkerson Method [6M]

2.Narrate Edmond-Karp maximum-flow algorithm [12M]

3.Illustrate strassen's algorithm with an example. [12M]

4.Expalin how you use "divide and conquer" in matrix computations [12M]

5.Describe the relation between time complexities of basic matrix operations [12M]

6.Illustarate LUP-Decomposition in detail [12M]

7.Differentiate following techniques

a)maximum flows and minimum cuts in a graph [6M]

b)Max flow equals min cut [6M]

8.Narrate following in nut shell

a)pre-flow push maximum algorithm [6M]

b)Bipatite matching problem [6M]

9.Discuss in detail about "Airlines scheduling" algorithm [12M]

10.Pictorially narrate below techniques

a)Image segmentation [6M]

b)Base ball elimination [6M]

UNIT – IV

GRAPHS & DFT

1.Explain How to find out path matrix with warshall algorithm [12M]

2.Differentiate Floyd and warshall algorithms [12M]

3.Write algorithms for following

a)Travelling sales person problem [6M]

b)Towers of Hanoi [6M]

4.Explain interpolation problem in detail [12M]

5.Narrate conversion between Base and Modulo Representation [12M]

6.Narrate Schonhage-Strassen Integer Multiplication algorithm [12M]

7.Explain following

a)Chinese Reminder Theorem [6M]

b)Fast Fourier theorem [6M]

8.Compare and contrast following

a) The FFT using bit operations [6M]

b) Products of polynomials [6M]

9.Illustrate polynomial multiplication and division algorithms [12M]

10.Define finite Automata? Discuss Chinese remaindering and interpolation

of polynomials [12M]

UNIT – V

LINEAR PROGRAMMING

1.Illustrate Geometry of the feasibility region and Simplex algorithm [12M]

2. Describe proof of NP-hardness and NP-completeness [12M]

3.Discuss any Randomized algorithms [12M]

4. Explain any 2 Approximation algorithms [12M]

5.Write in detail about Interior point Method [12M]

6.Illustarte advanced number theoretic Algorithm [12M]

7.Describe following

a) Polynomial-space-bounded problems [6M]

b) Nondeterministic Turing machines [6M]

8.Differentiate following

a)row-oriented lower bound on multiplications [6M]
b)column-oriented lower bound on multiplications [6M]

9.Narrate how we can implement Dictionaries randomly with algorithm [12M]

10.Copare “Randomized catching” and “chernoff bounds” in detail [12M]

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