M. Tech. Computer Science & Engineering (CBCS Pattern) Semester-II

PCSS21 - Advanced in Algorithms

P. Pages : 1 **GUG/S/25/10992**

Time : Three Hours * 1 1 2 6 * Max. Marks : 70

Notes : 1. Solve **any five** questions.
2. All questions carry equal marks.
3. Assume suitable data wherever necessary.

1. a) What is Amortized Analysis? Explain accounting method for binary increment counter. **7**

b) What is analysis of algorithm? Explain the analysis of quick sort. **7**

2. Determine the cost & draw a structure of an optimal Binary search Tree for a set of n = 5 keys with the following probability. **14**

i	0	1	2	3	4	5
pi	-	0.15	0.10	0.05	0.10	0.20
qi	0.05	0.10	0.05	0.05	0.05	0.10

Also write an algorithm for OBST.

3. a) Explain Topological sort procedure for Directed Acyclic Graph (DAG). **7**

b) Differentiate P and NP – classes. **7**

4. a) Explain Dijkstra's algorithm for single source shortest path. **7**

b) Explain two types of Randomize algorithm and compare them in brief **7**

5. a) Explain any two methods of information retrieval for internet and WWW. **6**

b) Write on RSA algorithm and give the solution, if p = 11, q = 29, n = 319 & e = 3, find the value of d? What is the encryption of the message M = 1000. **8**

6. a) What is Asymptotic notation? Explain its types with example. **6**

b) What is an optimal Huffman code for the following set of frequencies based on given 8 Fibonacci number. **8**

a : 1 b : 1 c : 2 d : 3 e : 5 f : 8 g : 13 h : 21

7. a) What is Flow Network? Write Ford-Fulkerson method. **7**

b) How polynomial reduction can be used for showing NP-completeness of a problem? Explain in details. **7**

8. a) Compute the values (d, x, y) that the call EXTENDED-EUCLID (99, 78) returns. Also write algorithm for EXTENDED-EUCLID form. **7**

b) Explain the following terms related to maximum flow network. **7**

i) Flow network ii) Flow conversion
iii) Residual network. d) Augmenting path.

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