M.Tech. Computer Science & Engineering (CBCS Pattern) Semester - II
PCSS21 - Advanced in Algorithms

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Notes :   1.   Attempt **any five** questions.
2.   All questions carry equal marks.
3.   Due credit will be given to neatness and adequate dimensions.
4.   Assume suitable data wherever necessary.

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

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

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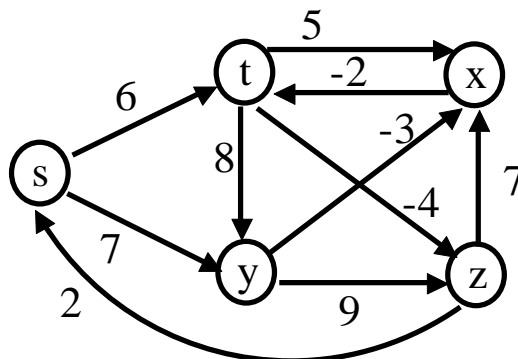keys with the following probability.

i	0	1	2	3	4	5
p_i	-	0.15	0.10	0.05	0.10	0.20
q_i	0.05	0.10	0.05	0.05	0.05	0.10

Also write an algorithm for OBST.

3.   a)   Use Strassen's Algorithm to compute the matrix product.   **7**

$$A = \begin{bmatrix} 1 & 4 \\ 6 & 8 \end{bmatrix} \begin{bmatrix} 2 & 3 \\ 5 & 7 \end{bmatrix}$$

b)   What is Extended - Euclid algorithm? Explain in detail.   **7**

4.   a)   Write Floyd-Warshall algorithm and show stepwise execution for following graph.   **8**

b)   Compute DFT of the vector (0, 1, 2, 3).   **6**

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

b)   Explain any two methods of information retrieval for internet and www.   **6**

6.	a)	Explain DFS algorithm with its associated data structure & perform analysis of it.	**7**
	b)	What are Randomized algorithms? Explain in brief.	**7**
7.	a)	How polynomial reduction can be used for showing NP-completeness of a problem? Explain in details.	**8**
	b)	What is Flow Network? Write Ford-Fulkerson method.	**6**
8.	a)	Explain Chinese remainder theorem with suitable example.	**10**
	b)	Compare and contrast, Decision problem and optimization problem.	**4**

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