(3 Hours) **[Total Marks: 80]**

N.B.: (1) Question No.1 is compulsory.

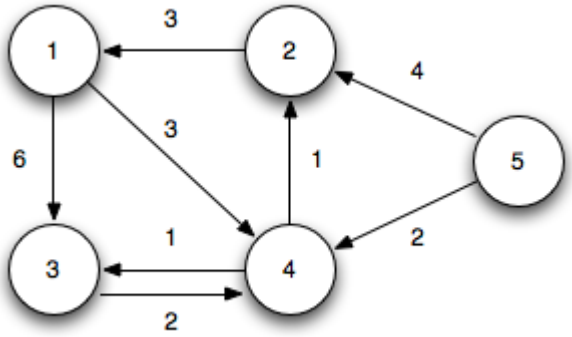
(2) Attempt **any three** out of remaining questions.

(3) Assume Suitable data if necessary.

(4) **Figures** to the **right** indicate full **marks**.

Q1.	(a)	Explain with example how divide and conquer strategy is used in Binary Search?	5
	(b)	Explain flow shop scheduling technique.	5
	(c)	Write a note on AVL Tree.	5
	(d)	Write an algorithm for finding minimum and maximum number from given set.	5
Q2.	(a)	What is longest common subsequence problem? Find LCS for following string. X=ACBAED Y=ABCABE	10
	(b)	Which are the different methods of solving recurrences? Explain with examples.	10
Q3.	(a)	Compare Greedy and Dynamic Programming approach for an algorithm design. Explain how both can be used to solve knapsack problem.	10
	(b)	Explain Huffman algorithm. Construct Huffman tree for **MAHARASHTRA** with its optimal code.	10
Q4.	(a)	Explain Job sequencing with deadlines. Let n=4,(p1,p2,p3,p4)=(100,10,15,27) and (d1,d2,d3,d4)=(2,1,2,1).Find feasible solution.	10
	(b)	Sort the following numbers using quick sort. Also derive time complexity of quick sort. 27 10 36 18 25 45	10

Q5. (a) Apply all pair shortest path on the following graph 10



(b) Given a chain of four matrices A_1, A_2, A_3 and A_4 with $P_0=5$, $P_1=4$, $P_2=6$, $P_3=2$ and $P_4=7$. Find m[1,4] using matrix chain multiplication 10

Q6. Write Note on (**Any two**) 20

i. Rabin Karp Algorithm.
ii. Topological Sort.
iii. Knuth-Morrie-Pratt algorithm.
iv. Red-Black Tree.

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