SCHOOL OF COMPUTER ENGINEERING

DEPARTMENT ELECTIVE / OPEN ELECTIVE

DESIGN AND ANALYSIS OF ALGORITHM

CS-2012

Time: 2 Hours   Full Marks: 50

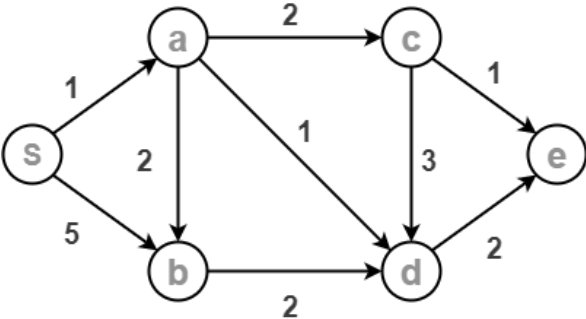(SECTION-A:1 Hour, SECTION-B:1 Hour)

Question paper consists of two sections-A, B.
Section A is compulsory.
Attempt any TWO questions from Sections B.
The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words

	SECTION-A(Time: 1 Hour)	
		5.5+
1.	a. Explain the properties of an algorithm with an example. What are the different Asymptotic notations? Write its properties.	4+
		3
		[12.5]
	b. Determine the frequency counts for all statements in the following algorithm segment.	
	i=1;	
	While(i<=n){	
	Sum=sum+i;	
	i=+i;}	
	Solve the recurrence relation using substitution method	

	$T(n) = T(1)$ $n=1$ c. $aT(n/b)+f(n)$ $n>1$,where a=5,b=4,and $f(n)=cn^2$	
		4+4+4.5
2.	a. What is the difference between sub-string and sub sequence. For two strings X = BACDB and Y = BDCB to find the longest common subsequence. b. Describe the Optimal Substructure and overlapping sub-problem property for Fibbonacci series. C. Using Prims's Algorithm, find the minimum Spanning tree source vertex 'S' to remaining vertices in the following graph- 	[12.5]
	SECTION-B(Time:1 Hour)	
3.	a. Define Branch-and-Bound method and Backtracking Approach. What is a state space tree b.Explain graph coloring problem with suitable example	[6+ 6.5= 12.5]
4.	a. Solve 0-1 knapsack problem with dynamic programming Selection of n=4 items, capacity of knapsack M=8 Item <1 2 3 4> Value <15 10 9 5> Weight wi <	[12.5]

	1 5 3 4 > b. Write an algorithm for computing gcd(m,n) using Euclid's algorithm. c. State the Subset Sum problem.	
5	a.Write the PARTITION() algorithm of Quick Sort and describe step by step how you would get the pass1 result by taking last element as pivot on the following data. 8, 2, 1, 5, 6, 1, 3, 7, 4, 9, 5 b.Derive the average case time complexity of quick sort. Write an algorithm to find Minimum and maximum number from a given series using divide and conquer method. Derive the time complexity for the same and compare with straight forward method.	6+ 6.5 [12.5]
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Name of the **M. NAZMA B. J. NASKAR**