Roll No. .....

97667

B.C.A. 2nd Semester

Examination–May, 2017

Mathematical Foundation of Computer Science

Paper-BCA-108

Time : 3 hours ***Max. Marks : 80***

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after the examination.

Note : Attempt **five** questions in all. Question No. 1 is **compulsory** and attempt **four** more questions by selecting **one** question from each unit. All questions carry equal marks.

1. Compulsory q ›n

(a) What do y ıean by Correlation ? List various ty ›f correlation.

(b) Find the edian for the series: 10, 12, 8 0, 60, 40, 80.

(c) What is aph ? Explain with the help of an nple.

(d) What is W ed Graph ?

(e) What is a What are its properties ?

(f) What is M Sort ?

(g) What is L VCC ?

(h) Find the our terms of a sequence from the l sive Formula:

$a_n = 5a_{n-}$ $n \geq 1$ with the initial condition }

UNIT-I

2. (a) In a study on patients, the following data were obtained. Calculate the arithmetic mean.

Age in Years	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89
No. of Cases	1	0	1	10	17	38	9	3

(b) Find the median of the following frequency distribution.

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of Students	15	17	19	27	21	15

3. (a) The Mean and Variance of 7 observations are 8 and 16 respectively. If five of the observations are 2, 4, 10, 12, 14, find the remaining two observations.

(b) Calculate Karl P n's coefficient of correlation for th wing data:

x:	5	10	15	)	22	25	30
y:	10	12	8		6	5	3

UNIT-

4. (a) Describe the me for analyzing an algorithm. What ou mean by best case and worst c me complexity of an algorithm ?

(b) Define linear se algorithm. Find the number of co isons required to search 9 in the s ıce 1, 3, 4, 5, 6, 8, 9, 11 using lin arch.

5. (a) Prove that the degree of any vertex in a simple graph of 'n' vertices cannot exceed n–1.

(b) Define Isomorphic and Homeomorphic graph with the help of a example.

UNIT-III

6. (a) What is Spanning Tree? Explain the various methods for constructing spanning tree for a connected simple graph.

(b) Draw a binary tree for the following Preorder and Inorder traversals:
Preorder: D E B F C A
Inorder: D B E A F C.

7. (a) (i) Convert the decimal number $(76.25)_{10}$ into binary number.

1010112 into decimal number.

(b) E n the algorithm for bubble sort a use bubble sort to put the el nts of the list 7, 8, 4, 6, 1, 0, 2 in ir sing order.

UNIT-IV

8. (a) S the recurrence relation: a $h_{n-1} + h_{n-2} = 0$, for $n \geq 2$.

(b) U Principle of Mathematical I ion, prove that:

1 $2.3.4 + 3.4.5 + \ldots\ldots + n(n+1)(n+2)$

= $\frac{(n+1)(n+2)(n+3)}{4}$, for all $n \in N$.

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9. (a) F as a linear combination numbers.

(b) Solve the congruences: $13x \equiv 10 \pmod{28}$

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