SUBJECT CODE : 15MT/AC/MS45

B. C. A. DEGREE EXAMINATION, APRIL 2017
FOURTH SEMESTER
COURSE   : ALLIED CORE
PAPER   : MATHEMATICS FOR COMPUTER SCIENCE-II
TIME   : 3 HOURS   MAX. MARKS : 100

SECTION – A

ANSWER ALL THE QUESTIONS: **(10X2=20)**

1. Define a graph.

2. Define finite graphs.

3. State Newton – Raphson's iteration formula.

4. Solve the following equations by Gauss - Jordan method:

   $$x + y = 2$$
   $$2x + 3y = 5.$$

5. Find the forward difference table for the following data

   x :   0   1   2   3

   y :   1   2   1   10

6. Give the Gauss - forward interpolation formula.

7. State Newton's forward interpolation formula for $\dfrac{dy}{dx}$ at $x = x_0$.

8. What is numerical differentiation?

9. What is a scatter diagram?

10. Define Regression.

SECTION – B

ANSWER ANY FIVE QUESTIONS: **(5X8=40)**

11. Prove that " One cannot walk through K$o$nigsberg so that each bridge is crossed exactly once."

12. Solve the following set of equations by Gauss – elimination method.
    $$x + y + z = 9$$
    $$2x - 3y + 4z = 13$$
    $$3x + 4y + 5z = 40.$$

13. Apply Gauss backward interpolation formula to find y(25) for the following data.

x	20	24	28	32
y	2854	3162	3544	3992

14. Evaluate $\displaystyle\int_0^1 \dfrac{dx}{1+x^2}$ using trapezoidal rule with $h = 0.2$.

15. Calculate the rank correlation coefficient from the following data:

X	48	33	40	9	16	16	65	24	16	57
Y	13	13	24	6	15	4	20	9	6	19

16. Give the difference between correlation and regression.

17. Find the value of $y(0.1)$ by Taylor's method if

$$\frac{dy}{dx} = 1 + xy \quad \text{with} \quad y_0 = 2.$$

SECTION – C

ANSWER ANY TWO QUESTIONS: (2X20=40)

18. a) Explain i) Isomorphic graphs
           ii) Homeomorphic graphs.

  b) Find a real root of the equation $x^3 - 3x + 1 = 0$ lying between 1 and 2 correct to three places of decimals by bisection method.

19. a. Use Lagrange's interpolation formula to find the value of y at $x = 6$ from the following data:

x	3	7	9	10
y	168	120	72	63

  b. Calculate coefficient of correlation from the following data

$$X : \quad 12 \quad 9 \quad 8 \quad 10 \quad 11 \quad 13 \quad 7$$
$$Y : \quad 14 \quad 8 \quad 6 \quad 9 \quad 11 \quad 12 \quad 3$$

20. a) Evaluate $\int_0^1 \frac{dx}{1 + x}$ by
    i) Simpson's one – third rule.
    ii) Simpson's three – eighth rule.

  b) Find y'(x) from the following data and hence find

x	0	1	2	3	4
y(x)	1	1	15	40	85

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