SUBJECT CODE : 11MT/AC/MS44

B. C. A. DEGREE EXAMINATION, APRIL 2016
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. Explain the meaning of tabulation.
2. Write a short note on Multiple Bar Diagram.
3. Write mean and variance of Poisson Distribution.
4. Define Level of significance.
5. Find the first approximation of the root lying between 1 and 2 for the equation $x^3 - x = 1$ by Newton Raphson's method.
6. Write any two iterative methods for solving simultaneous equations.
7. State Newton's Forward Interpolation formula.
8. Write down first derivative formula for Newton's forward formula.
9. Explain about Enciphering transformation and Deciphering transformation.
10. Discuss about Enciphering K_E with an example.

SECTION – B

ANSWER ANY FIVE QUESTIONS: (5X8=40)

11. The following are the weights in kg. of 50 college students. Construct a frequency table.

42	42	46	54	41	37	54	44	38	45
47	50	58	49	51	42	46	37	42	39
54	39	51	58	47	51	43	48	49	48
49	41	41	40	58	49	49	59	57	52
56	38	45	52	46	40	51	41	51	41

12. Represent the following data by a sub-divided bar diagram.

	Commodities	
	A	B
	(in Rs.)	(in Rs.)
Value of raw material	175	150
Other Production Expenses	30	25
Profits	20	25

13. The mean of a binomial distribution is 5 and standard deviation is 2. Determine the distribution.

14. Using the Newton's method, find the root between 0 and 1 of $x^3 = 6x - 4$ correct to 5 decimal places.

15. Using Lagrange's interpolation formula, find y(10) from the following table:

x: 5   6   9   11
y: 12   13   14   16

..2

16. Find first derivative of $x^{\frac{1}{3}}$ at x=50 for the given table below:

x:	50	51	52	53 5	4	55	56
$y=x^{\frac{1}{3}}$	3.6840	3.7084	3.7325	3.7563	3.7798	3.8030	3.8259

17. Find the inverse of $A = \begin{matrix} 2 & 3 \\ 7 & 8 \end{matrix} \in M_2 \; Z/26Z$.

SECTION – C
ANSWER ANY TWO QUESTIONS: **(2X20=40)**

18. a. Explain the term classification of statistical data. What are the types of classification generally followed in statistical data?
    b. Draw a circular diagram from the following data: $(10 + 10)$

Type of Commodity	Expenditure in Rupees	
	Family A	Family B
Food	300	500
Rent	200	350
Clothes	125	250
Education	110	225
Miscellaneous	75	125
Savings	90	150

19. a. The sales manager of a large company conducted a sample survey in   states A and B taking 400 samples in each case. The results were

	State A	State B
Average Sales	Rs. 2500	Rs. 2200
Standard Deviation	Rs. 400	Rs. 550

Test whether the average sales is the same in the two states at 1% level.

   b. Solve the following by Gauss Elimination method:
      $3x + 4y + 5z = 18, \; 2x - y + 8z = 13, \; 5x - 2y + 7z = 20.$ $(10+10)$

20. a. Apply Gauss's forward formula to obtain $f(x)$ at $x = 3.5$ from the table below:

x:	2	3	4	5
$f(x)$:	2.626	3.454	4.784	6.986

   b. Prove:
      Let $A = \begin{matrix} a & b \\ c & d \end{matrix} \in M_2 \; Z/NZ$ and set $D = ad - bc$.
      The following are equivalent:
      (a) $g.c.d.\{D, N\} = 1$;
      (b) A has an inverse matrix;
      (c) if x and y are not both 0 in Z/NZ, then $A = \begin{matrix} x \\ y \end{matrix} \neq \begin{matrix} 0 \\ 0 \end{matrix}$;
      (d) A gives a 1-to-1 correspondence of $(Z/NZ)^2$ with itself. $(10+10)$

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