

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI
END-OF-SEMESTER EXAMINATIONS : NOVEMBER-2024
COURSE NAME: B.C.A **MAXIMUM MARKS: 75**
SEMESTER: I **TIME : 3 HOURS**

PART - III**MATHEMATIC FOUNDATION I : COMPUTER ORIRNTATION NUMERICAL
AND STATISCAL METHODS****SECTION – A****(10 X 1 = 10 MARKS)****ANSWER THE FOLLOWING QUESTIONS.****MULTIPLE CHOICE QUESTIONS.****(K1)**

1. Using Bisection method find the root of $\cos(x) - x * e^x = 0$ with $a = 0$ and $b = 1$. _____
 a) 0.617 b) 0.527 c) 0.517 d) 0.717
2. Find the values of x, y, z in the following system of equations by gauss Elimination method
 $2x + y - 3z = -10, -2y + z = -2, Z = 6$ _____
 a) 2, 4, 6 b) 2, 7, 6 c) 3, 4, 6 d) 2, 4, 5
3. Given $n+1$ data pairs, a unique polynomial of degreepasses through the $n+1$ data points.
 a) $n+1$ b) n c) n or less d) $n+1$ or less
4. Which is a method of measuring correlation?
 a) Graphical correlation b) Scatter diagram c) Karl Pearson's Coefficient d) all of these.
5. Sir Francis Galton first introduction regression in the year _____.
 a) 1800 b) 1877 c) 1877 d) 1822 .

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES.**(K2)**

6. Illustrate the Horner methods.
7. Explain gauss elimination method.
8. Explain power series approximation.
9. Define correlation
10. Write a short note on regression.

SECTION – B **(5 X 5 = 25 MARKS)****ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)**

11. a) Find the positive root of $X - \cos x = 0$ by bisection methods
 (OR)
 b) Solve for a positive root of $x - \cos x = 0$ by Regular falsi methods
12. a) Solve the following system
 $x+5y+z=14, 2x+y+3z=13, 3x+y+4z=17$
 (OR)
 b) Solve the System by Gauss -Elimination method
 $2x+3y-z=5, 4x+4y-3z=3, 2x-3y+2z=2$ **(CONTD.....2)**

13.a) The population of a town is as follows

Year x	1941	1951	1961	1971	1981	1991
Population in lakhs Y	20	24	29	36	46	51

Estimate the population increase during the period 1946 to 1976.

(OR)

b) Evaluate the solution of the differential equation $dy/dx = y^2 + 1$ by taking four term of its MacLaurin series for $x=0, (0.2), (0.6)$ given $y(0) = 0$. Compare your result with exact solution.

14.a) Show the straight line trend by the method of least squares to the following data and find the trend values

Year	1983	1984	1985	1986	1987	1988
Sales of TV set (in '000)	10	13	16	21	24	30

(OR)

b) Show the Karl Pearson's coefficient of correlation.

X	6	2	10	4	8
Y	9	11	5	8	7

15.a) Find regression lines by using assume mean

X	40	38	35	42	30
Y	30	35	40	36	29

(OR)

b) List out the types of regression.

SECTION – C

(5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

(K4 (Or) K5)

16. a) Find the positive root of $x^3 - x - 1 = 0$ correct to four decimal places by bisection methods.

(OR)

b) Assume that a root of $x^3 - 9x + 1 = 0$ lies in the interval $(2, 4)$. Find that root by bisection methods.

17.a) By the method of triangularization, solve the following system

$$5x - 2y + z = 4, 7x + y - 5z = 8, 3x + 7y + 4z = 10.$$

(OR)

b) Solve the system of equations by i) Gauss elimination method ii) Gauss-Jordan method
 $x + 2y + z = 3, 2x + 3y + 3z = 10, 3x - y + 2z = 13$

18. a) The following data are taken from the stream table

Temp $^{\circ}\text{C}$	140	150	160	170	180
Pressure kgf/cm^2	3.685	4.854	6.302	8.076	10.225

Find the pressure at temperature $t = 142^{\circ}\text{C}$ and $t = 175^{\circ}\text{C}$

(OR)

b) From the following table find the value of $\tan 45^{\circ} 15'$.

X^0	45	46	47	48	49	50
$\tan x^0$	1.00000	1.03553	1.07237	1.11061	1.15037	1.19175

(CONTD....3)

19.a) Point out the different types of correlation.

(OR)

b) Two judges in a beauty contest rank the 12 entries as follows:

X	1	2	3	4	5	6	7	8	9	10	11	12
Y	12	9	6	10	3	5	4	7	8	2	11	1

Compute the rank correlation between the two.

20.a) Find regression lines by using actual mean PG 11.05

X	3	5	6	8	9	11
Y	2	3	4	6	5	10

(OR)

b) Compare correlation and regression
