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Total No. of Pages: 03
Total No. of Questions: 09

B. Tech. (ME) (Sem.-6th)
STATISTICAL AND NUMERICAL METHODS IN ENGINEERING

Subject Code: BTME-604

Paper ID: [A2364]

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATE:

1. *Section-A is compulsory.*
2. *Attempt any four question from Section-B*
3. *Attempt any two question from Section-C*

SECTION-A

(10x2=20)

Q.1.

- (a) Round off the number 37.46235 to 4 significant figures and calculate relative error.
- (b) Define Geometric and Arithmetic Mean.
- (c) Four cards are drawn from a pack of cards. Find the probability that there is one card of each suit.
- (d) Define Chi square test.
- (e) Discuss Regula falsi method to find real root of a equation.
- (f) Prove that $\Delta \nabla = \Delta - \nabla$.
- (g) Evaluate $\int_0^6 \frac{1}{1+x^2} dx$ by using Trapezoidal Rule.
- (h) What is the first order initial value problem?
- (i) Calculate median from the values 30, 45, 75, 65, 50, 52, 28, 40, 49, 35, 52.
- (j) A box contains 3 red and 7 white balls. One ball is drawn and in its place ball of other color is put in the box. Now one ball is drawn. Find the probability that ball is Red.

SECTION-B

(4x5=20)

Q.2. Solve the following system of equations by Gauss Jordan Method.

$$2x - 2y + 5z = 13, 2x + 3y + 4z = 20, 3x - y + 3z = 10$$

Q.3. Find the real root of the equation $3x = \cos x + 1$ correct to the three decimal place using Newton-Raphson method.

Q.4. Given the table of values, find $y(2.8)$

x	2.0	3.0	4.0
y	6.6	9.2	8.6

Q.5. The population of the certain town (as obtained from census data) is shown in the following table

Year	1961	1971	1981	1991	2001
Population in thousands	19.96	39.65	58.81	77.21	94.61

Find the rate of Growth of population in 1991.

Q.6. In a book of 520 pages, 390 typographical error occur. Assuming Poisson law for the number of errors per page, Find the probability that a random sample of 5 pages will contain no error.

SECTION-C

(2x10=20)

Q.7. Given $\frac{dy}{dx} = xy$, $y(1) = 5$. Find the solution Correct to three decimal places in the interval (1, 1.3) by using Euler's Modified method with step size 0.1.

Q.8. A random sample of 10 boys had the following I.Q's: 70, 120, 110, 101, 88, 83, 95, 98, 107, and 100. Do these data support the assumption of a population mean I.Q of 100? Given $t_{0.05} = 2.262$ for 9 degree of freedom.

Q.9. A Survey of 320 families with 5 children each revealed the following distribution.

No. of boys	5	4	3	2	1	0
No. of Girls	0	1	2	3	4	5
No. of families	14	56	110	88	40	12

Is this result consistent with the hypothesis that male and female births are equally probable?

$\chi^2_{0.05}$ For 4 degree of freedom is 9.488.

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