SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL No: | | | | | | | | | | | | |

Total number of pages:[2]
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B.Tech. || ME || 6th Sem

Statistical &Numerical Methods in Engineering

Subject Code:BTME-604

Paper ID: (for office use)

Time allowed: 3 Hrs **Max Marks: 60**

Important Instructions:

- **All questions are compulsory**
- **Assume any missing data**
- **Additional instructions, if any**

PART A (2×10)

Q. 1. Short-Answer Questions: All COs

(a) A fair of coin tossed 6 times. Find the probability of getting exactly 2 heads.
(b) Define sampling?
(c) State Simpson's $3/8^{th}$ rule.
(d) Define a Random Variable?
(e) Give two properties of Normal Distributions.
(f) A population consists of four numbers 2,3,4,5.find the population mean and the population slandered deviation.
(g) Find the mean and mode of the set 8,4,7,84,9,19,5,9.
(h) Write the formula of Runge-Kutta method of 4^{th} order.
(i) Define iterative method?
(j) Define pivoting and its types?

PART B (8×5)

Q. 2. Find a positive root of $x^4 - x = 10$ using Newtown's-Raphson's Method. COa

OR

Find the rate of convergence of secant method. COa

Q. 3. Determine the largest Eigen value and the corresponding Eigen vector of the matrix

$$\begin{pmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{pmatrix}$$

OR

Apply Gauss-Jordon method to solve the equation x+y+z=9 , 2x-3y+4z=13 and 3x+4y+5z=40 COb

Q. 4. Compute $f^{i}(x)$ and $f^{ii}(x)$ at x=25 from the following table: COc

X	15	17	19	21	23	25
F(x)=$\sqrt{x}$	3.873	4.123	4.359	4.583	4.796	5.0

OR

Derive Simpson's rule and hence evaluate $\int_0^{\pi} sinxdx$ COc

Q. 5. Given $\frac{dy}{dx} = \frac{y-x}{y+x}$ with y(0)=1 .Find y(0.1) and y(0.2) using Runge-Kutta Method of 4th order. COd

OR

Using Taylor's series method evaluate the integral of $\frac{dy}{dx} - 2y = 3e^x$,y(0)=0 at x=0.1 & 0.2. COd

Q. 6. Fit a Poisson distribution to the following data and test for its goodness of fit at 5% level of significance: COe

X:	0	1	2	3	4
F:	419	352	154	56	19

OR

The mean and variance of a Binomial variate X are 2 & 1,respectively.Find the probability that X takes a value greater than 1. COe