SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL NO: Reappear.

Total number of pages: [3] **Total number of questions: 06**

B.Tech. -CSE/ 3rd Sem (Reappear) 2012 Batch – 2014 Batch.

MATH III

Subject Code: ~~CSE-302~~ BTAM 302

Paper ID:

Batch: before 2015

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

Important Instructions:

- **All questions are compulsory**
- **Non Scientific calculator is allowed**
- **Scientific tables are allowed**

PART A (2×10)

Q. Answer in brief:

1.

(a) State Eulers formula for a function to be expanded in Fourier Series.

(b) Write Fourier series of $f(x) = e^{-x}$ in the interval $(0, 2\pi)$.

(c) Solve following system of equations by Gauss elimination method

$$x + 2y + z = 3;\ 2x + 3y + 3z = 10;\ 3x - y + 2z = 13$$

(d) Using Euler's method, solve numerically the equation

$$\frac{dy}{dx} = x + y;\ y(0) = 1 \text{ at } x = 1.0 \text{ by taking } h = 0.2$$

(e) If the probability of a defective bolt is 0.1. Find the standard deviation (S.D.) for the defectives bolts in a total of 400.

(f) A coin was tossed 400 times and head turned up 216 times. Test the hypothesis that coin is unbiased

(g) Define Critical Region in sampling

(h) Define Analytic function.

(i) Find partial differential equation of $z = (x^2 + a)(y^2 + b)$

(j) Find $L\left(\frac{e^{-at} - e^{-bt}}{t}\right)$

PART B (8×5)

Q.2. Obtain the Fourier series to represents $f(x)=\frac{(\pi-x)^2}{4}$ in the interval $[0, 2\pi]$

Hence deduce the sum of the series $\frac{1}{1^2}+\frac{1}{3^2}+\frac{1}{5^2}+\ldots\ldots$

OR

CO1

Solve the initial value problem

$$y''+5y'+5y=e^{-t}\sin t,\ y(0)=0,\ \ y'(0)=1$$

by using method of Laplace Transformation

Q.3. Solve the following system of linear equations by using Gauss-Siedel iteration method

$$10x+y+2z=44$$
$$2x+10y+z=51$$
$$x+2y+10z=61$$

by taking $[0,0,0]'$ as initial solution

OR

Find the largest eigenvalue and corresponding eigen vector of following matrix by Power method

CO3

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

by taking $[1,1,1]'$ as initial solution

Q.4. .Find the imaginary part of analytic function whose real part is $x^3-3xy^2+3x^2-3y^2$

OR

CO2

Estimate the solution of the differential equation

CO3

$$\frac{dy}{dx}=x+y;\ y(0)=1 \text{ at } x=0.2$$

by Runge-Kutta fourth order method using $h=0.1$

Q. 5. If the probability that an individual suffers a bad reaction from certain injection is 0.001. Find the probability that out of 2000 individual, exactly 3 individuals will suffer a bad reaction

OR

Solve $\frac{\partial^3 z}{\partial x^3} - 3\frac{\partial^3 z}{\partial x^2 \partial y} + 4\frac{\partial^3 z}{\partial y^3} = e^{x+2y}$ CO4

CO2

Q. 6. In a normal distribution, 31% of the items are under 45 and 8% are over 64. Find the mean and standard deviation of the distribution

OR

A die is thrown 276 times and results of these throw are given below

No. appeared on die	1	2	3	4	5	6
Frequency	40	32	29	59	57	59

Test whether the die is biased or not.

CO4