Roll No.

Total No. of Pages: 02
Total No. of Questions: 09

B.TECH (IT, CSE) (Sem.-4th)

MATHEMATICS-III

Subject Code: BTCS-402
Paper ID: [A1184]

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

INSTRUCTIONS TO CANDIDATE:

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

SECTION-A

10x2=20

Q.1.

(a) Explain why *f(x)=cosec x* can not be expanded as a Fourier series in the internal (-π, π)

(b) Find the laplace transform of $\text{Cos}^2\, 2t$.

(c) Find the partial differential equation by eliminating the arbitrary functions from

$$Z = f(x+at)+g(x-at)$$

(d) If w= log z ,find $\frac{dw}{dz}$ and determine where w is not analytic.

(e) The probability that a pen manufactured by a company is defective is 0.1. If 12 such pens are manufactured, find the probability that at least two will be defective.

(f) Find the inverse Laplace transform of

$$\frac{s+2}{s^2-4s+13}$$

(g) State any two properties of t- distribution.

(h) A sample of 900 members is found to have a mean of 3.4 cm. Can it be reasonably regarded as a truely random sample from a large population with mean 3.25 cm and standard deisatim1.61 cm.

(i) State Central limit theorem for the sampling distribution of mean.

(j) State Cancley Riemann equations for a function *f(z)=u(x, y)+í v(x, y) to be analytic (z = x + iy).*

SECTION-B

4x5=20

Q.2. Find the analytic function of a complex variable z whose real part is $\dfrac{\sin 2x}{\cosh 2y - \cos 2x}$

(5)

Q.3. Apply Gauss seidal method to solve the equation *20x+y-2z=17, 3x+20 y-z = -18*

2x-3y+20z =25

Q.4. In a normal distribution,31% of the items are under 45 and 8% are over 64. Find the mean and standard deisation of the distribution.

Q.5. The means of simple samples of sizes 1000 and 2000 are 67.5 and 68.0 cm respectively. Can the samples be regarded as drawn from the same population of standard deisation 2.5 cm.

Q.6. Find the laplace transform of $\dfrac{Cos\ at - Cos\ bt}{t}$

SECTION-C

2x10=20

Q.7. Solve the partial differential equation

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

Q.8. Solve the equation $\dfrac{dy}{dx}$=log(x+y), y(0) = 2 at x = 1.2 and 1.4 with h=0.2 by Euler's modified method.

Q.9. Expand f(x) = $\begin{Bmatrix} \frac{1}{4} - x \ if\ 0 < x < \frac{1}{2} \\ x - \frac{3}{4} if\ \frac{1}{2} < x < 1 \end{Bmatrix}$ as the Fourier series of sine terms.

.....END.....

M-56605