Roll No_____

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

[Total No. of Pages: 02

MATHEMATICS III

SUBJECT CODE: BTCS402

PAPER ID: [A1184]

Time: 03 Hours

Marks: 60

Instruction to Candidates:

1) Section-A is compulsory consisting of Ten questions carrying two marks each

2) Section-B contains Five questions carrying Five marks each and students has to attempt any Four questions.

3) Section-C contains Three questions carrying Ten marks each and students has to attempt any Two questions.

Section-A

Q1)

a) The cofficient a_0 in the half range cosine series for $f(x) = \sin kx$, for k is not an integer is given by...

b) Does the Laplace Transform of $\dfrac{\cos at}{t}$ exist? Justify.

c) Evaluate $L\left\{\displaystyle\int_0^t \dfrac{1-e^t}{t}\,dt\right\}$,

d) Find the solution to the PDE, $z = px + qy - 2\sqrt{pq}$.

e) Solve the differential equation $\left(2D^2 + 5DD' + 2D'^2\right)z = 0$.

f) Difference between Direct and Iterative methods of solving simultaneous linear equations is...

g) Is modified Euler method a Predictor-Corrector method? (True/False).Give the name of another two Predictor-Corrector methods.

h) Find the mean of the binomial distribution $B\left(4, \dfrac{1}{3}\right)$.

i) If the chance that one of the 10 telephone lines is busy at an instant is 0.2, then what is the chance that five of the lines are busy.

j) Find the analytic function whose imaginary part is $v = 3x^2y - y^3$?

Section-B

Q2) Using Laplace Transform, Evaluate $\int_0^\infty \frac{e^{-at} \sin t}{t} dt$

Q3) Find the dominant Eigen value and the corresponding Eigen vector of the matrix using Power method, $\begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$.

Q4) A manufacturer knows that the condensers he makes contains on an average 2% defective. He packs them in boxes of 100. What is the probability that a box selected at random will contain 3 or more defective condensers?

Q5) Using Modified Euler's method, Obtain a solution of

$\frac{dy}{dx} = 1 - y, y(0) = 0,$ for the range $[0, 0.2]$ in steps of 0.1.

Q6) Fit a poisson distribution to the following data and test for goodness of fit at 5% level of significance.

x:	0	1	2	3	4
y:	419	352	154	56	19

Section-C

Q7) Obtain the half-range Cosine and Sine series for the function $f(x) = x, 0 \le x \le \pi$.

Q8) Solve the PDE $(D^2 + DD' - 6D'^2)z = \cos(2x + y)$.

Q9) If $f(z)$ is a holomorphic function of z, show that, $\left\{ \frac{\partial}{\partial x} |f(z)| \right\}^2 + \left\{ \frac{\partial}{\partial y} |f(z)| \right\}^2 = |f'(z)|^2$.

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