Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE) (2011 Batch) (Sem.–4)

MATHEMATICS – III

Subject Code : BTCS-402

Paper ID : [A1184]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS 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 have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION–A

Answer briefly :

1. Define periodic functions.
2. Find Laplace transform of $te^{-t}\sin 3t$.
3. Examine whether $f(x) = \sin\frac{1}{x}$ can be expanded in Fourier series in $[-\pi, \pi]$.
4. Solve $(D^2 + 4DD' - 5D'^2)z = \sin(2x + 3y)$
5. Define conjugate functions.
6. What is null hypothesis?
7. What do you mean by degree of freedom?
8. A coin is tossed 400 times and head turned up 216 times. Test the hypothesis that coin is unbiased.
9. What is the mean and variance of poisson distribution?
10. What do you mean by critical region?

SECTION-B

11. Obtain fourier series for the function

$$f(x) = \begin{cases} x, & -\pi < x < 0 \\ -x, & 0 < x < \pi \end{cases}$$

and show that $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \cdots = \frac{\pi^2}{8}$.

12. Define second shifting theorem and find the laplace transform of sintu($t - \pi$).

13. Solve $r - 4s + At + p - 2q = e^{x+y}$.

14. Solve by using guass Jordan method

$$x + 2y + z - w = -2,$$

$$2x + 3y - z + 2w = 7,$$

$$x + y + 3z - 2w = -6,$$

$$x + y + z + w = 2.$$

15. Given $y' = x^2 + y^2$, $y(0) = 1$. Determine $y(0.1)$, $y(0.2)$ by using modified Euler Method.

SECTION-C

16. Find the mean and variance of Normal distribution.

17. Show that the function $u = e^{-2xy}\sin(x^2 - y^2)$ is harmonic. Find conjugate function v and express $u+iv$ as analytic function of z.

18. Solve

a) $z(x + y)p + z(x - y)q = x^2 + y^2$

b) $4r - 4s + t = 16\log(x + 2y)$