(Pages: 2)

Reg. No.....

Maximum: 100 Marks

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2016

Fourth Semester

EN 010 401—ENGINEERING MATHEMATICS-III

(New Scheme--2010 Admission onwards)

[Regular/Improvement/Supplementary]

{Common for all branches}

Time: Three Hours

Part A

Answer all questions.

Each question carries 3 marks.

- 1. Find the fourier series of f(x) = x(2l x) in (0, 2l).
- 2. Find the Fourier Cosine Transform of e^{-ax} . (a > 0).
- 3. Form the partial differential equation by eliminating the arbitrary function 'f' from $f(z-xy, x^2+y^2)=0$.
- 4. Find the binomial distribution which has mean 2 and variance 4/3.
- 5. Define type I and type II error.

 $(5 \times 3 = 15 \text{ marks})$

Part B

Answer **all** questions.

Each question carries 5 marks.

- 6. Find the Fourier series expansion of $f(x) = x^2 + x$ in (-2, 2).
- 7. Find the Fourier transform of unit step function.
- 8. Solve $x^4 p^2 yzq z^2 = 0$.
- 9. A random variable X has a Poisson distribution of $\sqrt{2} P(X \le 1) = P(X \le 2)$ find P(X = 0).
- 10. A random sample is taken from a normal population with mean 30 and standard deviation 4. How large a sample should be taken of the sample is to be between 25 and 35 with probability 0.98?

 $(5 \times 5 = 25 \text{ marks})$

Turn over

Part C

Answer all questions. Each full question carries 12 marks.

11. Find the Fourier series $f(x) = |\cos x| \text{ in } -\pi \le x \le \pi$.

Or

12. Find the Fourier series expansion of:

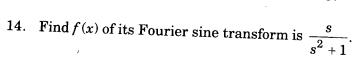
$$f(x) = \begin{cases} 1, & 0 < x < 1 \\ 2, & 1 < x < 3. \end{cases}$$

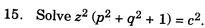
13. Find the Fourier Transform of f(x) if:

$$f(x) = \begin{cases} 1 - |x| & |x| < 1 \\ 0, & |x| > 1, \end{cases}$$

Hence prove that $\int_{0}^{\infty} \frac{\sin^{4} x}{x^{4}} dx = \frac{\pi}{3}.$

Or





Or

16. Solve
$$(pq - p - q)(z - px - qy) = pq$$
.

17. In a normal distribution 7% of the items are under 35 and 10% of the items are above 55. Calculate the mean and variance.

Or

18. Fit a Binomial distribution to the following frequency distribution:

\boldsymbol{x}	:	0	1	2	3	4	5	c
f	:	13	25	52	58	20	10	0
					90	04	16	4.

19. Two independent samples of size 7 and 8 item here the following values :

Do the estimates of means of population differ significantly at 5% level of significance.

Or

20. The mean life time of a sample of 9 items is 49.11 and standard deviation 2.47. Does this mean value differ significantly from the assured mean value 47.5.

 $(5 \times 12 = 60 \text{ marks})$