Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

Roll No .....

BE-3001 (EC) (CBGS)

B.E., IV Semester

Examination, November 2018

Choice Based Grading System (CBGS)

Mathematics - III

Time : Three Hours

https://www.rgpvonline.com ***Maximum Marks : 70***

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

1. a) Find the Fourier series to represent $f(x)=x+x^2$ in interval $(-\pi,\pi)$.

   b) Expand the function $f(x)=x\sin x$ as Fourier series in interval $(0,2\pi)$.

2. a) Find the Fourier cosine transform of the function $f(x)$ of $f(x)=\begin{cases}\cos x, & 0<x<a\\ 0, & x>a\end{cases}$.

   b) Find Fourier sine transform of $f(x)=\frac{1}{x}$.
   https://www.rgpvonline.com

3. a) Find the Laplace transform of the followings

   i) $\frac{\sin t}{t}$ ii) $\frac{e^{-t}\sin 2t}{t}$

   b) Evaluate the integral $\int_0^\infty te^{-3t}\sin t dt$.

4. a) Find the inverse Laplace transforms of the followings:

   i) $\frac{1}{9s^2+25}$ ii) $\frac{5s-18}{9s^2+25}$

   b) Evaluate $L^{-1}\left\{\frac{1}{(s+1)(s-2)}\right\}$.

5. a) If there are 3 misprints in a book of 1000 pages, find the probability that a given page will contain

   i) No misprint https://www.rgpvonline.com

   ii) More than 2 misprints

   b) Find $L\left\{\frac{1-e^t}{t}\right\}$

6. a) Find mean and variance of Prison distribution.

   b) In a binomial distribution the mean and standard deviations are 12 and 2 respectively. Find n and p.

7. a) Fit a straight line to the data:

x:	1	4	2	3	5
y:	3	1	2	5	4

   b) If on an average one ship in every ten is wrecked. find the probability that out of 5 ships expected to arrive 4 atleast will arrive safely. https://www.rgpvonline.com

8. a) Use Laplace transform to solve.

   $y''+2y'+5y=3e^{-t}\sin t$

   Given that $y(0)=0,\ y'(0)=1$.

   b) If 3% of the electric bulbs manufactured by a company are defective, find the probability that in a sample of 100 bulbs exactly 5 bulbs are defective.

******