Roll No .....

BE-3001 (EC) (CBGS)

B.E., IV Semester

Examination, May 2018

Choice Based Grading System (CBGS)

Mathematics - III

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions out of eight.

ii) All questions carry equal marks.

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

   b) Expand $f(x)=\pi x-x^2, 0<n<\pi$ in a half range sine series.

2. a) Find Fourier sine transform of $\frac{e^{-ax}}{x}$.

   b) Find the cosine transform of $\frac{1}{x^2+a^2}$

3. a) Find Laplace transform of the followings:

   i) $2\sin t\cos t$

   ii) $\left(t^2+1\right)^2$

   b) Find Laplace transform of the followings:

   i) $t\sin at$

   ii) $t^n e^{at}$

4. a) Evaluate the followings:

   i) $L^{-1}\left\{\frac{3s+7}{s^2-2s-3}\right\}$

   ii) $L^{-1}\left\{\frac{3s-2}{s^2-4s+20}\right\}$

   b) Using convolution theorem, evaluate

   $$L^{-1}\left\{\frac{1}{(s-1)(s-2)}\right\}$$

5. a) Find the value of k for which the function

   $$f(x)=\begin{cases} kx^2 & , 0\le n\le 3 \\ 0 & , \text{otherwise} \end{cases}$$

   is a probability density function. Also, compute $p(1\le n\le 2)$.

b) A coin is tossed 4 times. What is the probability of getting

i) two heads

ii) atleast two heads

6. a) Use Poisson distribution to find the probability of at most 5 detective fuses in a box of 200 fuses. Experience shows that 2% of such fuses are defective.

b) Find mean and variance of binomial distribution.

7. a) Use least square method to Dot a straight line to the data

x	1	2	3	4
y	3	7	13	21

b) Dot a Poisson distribution to the set of observations.

x	0	1	2	3	4
y	122	60	15	2	1

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

i) No misprint

ii) More than 2 misprints

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

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