

4401

BOARD DIPLOMA EXAMINATION, (C-14)
MARCH /APRIL-2019
FOURTH SEMESTER(COMMON) EXAMINATION
ENGINEERING MATHEMATICS-III

Time: 3 hours

Max.Marks: 80

PART-A

10x3=30M

- Instructions:** 1) Answer all questions.
2) Each question carries three marks.
3) Answers should be brief and straight to the point and shall not exceed five simple Sentences.

1) Solve $(D^2-2D+1)y=0$.

2) Solve $(D^3-6D^2+11D-6)y=0$.

3) Find the particular integral of $(D^2+4D+4)Y=e^{2x}$.

4) Find $L\{2e^t+5t+8.\sin 4t\}$.

5) Find $L\{t^7 e^{15t}\}$.

6) Find $L^{-1}\left\{\frac{1}{s-3}+\frac{1}{s}+\frac{s}{s^2+36}\right\}$.

7) Find $L^{-1}\left\{\frac{1}{(s+5)^2+4}\right\}$.

- 8) Write the Euler's formulae for Fourier series of a function $f(x)$ in the interval $(0,2\pi)$.

- *9) Find the Fourier sine series, if $f(x) = 1$ in the interval $(0, \pi)$.
- 10) What is probability that a leap year selected at random will have fifty three Sundays?

PART-B

10x5=50M

Instructions: (1) Answer any FIVE questions.
(2) Each question carries ten marks.

11) a) Solve $(D^2 - 4D + 4)y = 4e^{3x}$.

b) Solve $(D^2 - 9)y = \sin 2x$

12) Solve $(D^2 - 3D + 2)y = e^{4x} + x + x^2$.

13) a) Find $L\{e^{-t} \cdot \sin t \cdot \cos t\}$.

b) Find $L\left\{\frac{\cos 2t - \cos 3t}{t}\right\}$.

14) a) Find $L^{-1}\left\{\frac{3s - 2}{s^2 - 4s + 20}\right\}$.

b) Find $L^{-1}\left\{\frac{1}{(s+1) \cdot (s+5)}\right\}$.

15) Expand the function $f(x) = \frac{x}{2}$ as a Fourier series in $(-\pi, \pi)$.

16) Obtain Fourier series for the function $f(x) = e^x$ in $(-\pi, \pi)$.

- * 17) One card is drawn from a well-shuffled pack of 52 cards. Find the probability that card drawn is (i) a club, (ii) non-club, (iii) a red card, (iv) a non-red card and (v) red ace.

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18) a) Evaluate $p(A \cup B)$ if $2P(A) = P(B) = \frac{5}{13}$ and $P(A/B) = \frac{2}{5}$.

b) Probability of solving problem independently by A and B are $\frac{1}{2}$ and $\frac{1}{3}$ respectively. If both try to solve the problem independently, find the probability that the problem will be solved.

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