

6242

BOARD DIPLOMA EXAMINATION, (C-16)

MARCH /APRIL-2019

THIRD SEMESTER(COMMON) EXAMINATION

ENGINEERING MATHEMATICS-II

Time: 3 Hours

Max.Marks: 80

PART-A

10x3=30M

- Instruction :** 1) Answer **all** questions.
2) Each question carries **three** marks.

1) Evaluate $\int (\sqrt{x} + \sin 2x - 3^x) dx$

2) Evaluate $\int \frac{3x-5}{3x^2-10x+17} dx$

3) Evaluate $\int_0^2 (x^2+1).dx$

4) Find the mean value of $y^2 = 8x$ over $(0,3)$.

5) Find the Laplace transform of $(t^2 + 1)^2$

6) Find $L^{-1} \left\{ \frac{3}{(s+1)^4} \right\}$

7) Find the fourier sine series for $f(x) = 1$ in $0 < x < \pi$.

8) Form the differential equation for the family of curves
 $y = a.\cos 5x + b.\sin 5x$.

9) Solve, $x^2.dy + y^2. dx = 0$

* 10) Solve, $(D^2 - 2D + 10)y = 0$

PART-B

10x5=50M

Instructions : 1) Answer any **Five** questions.

2) Each question carries **Ten** marks.

11) a) Evaluate, $\int \sin^5 \theta \cdot \cos^3 \theta \cdot d\theta$

b) Evaluate, $\int \frac{1}{3-2\cos x} \cdot dx$

12) a) Evaluate, $\int e^x \left\{ \frac{1+x \log x}{x} \right\} \cdot dx$

b) Evaluate $\int_0^{\pi/4} \frac{\sec^2 x}{(1+\tan x)} dx$

13) a) Find the area bounded by the parabola $y = x^2$, x-axis between the abscissa $x=1$ and $x=2$.

b) Find the volume of the solid obtained by revolving the ellipse

$$\frac{x^2}{25} + \frac{y^2}{9} = 1 \text{ about x axis.}$$

14) a) Define convolution theorem and hence find $L^{-1} \left[\frac{1}{S(S+1)} \right]$ using convolution theorem

b) Evaluate, $\int_1^m x^3 \cdot dx$ using trapezoidal rule by taking $n=10$.

15) a) Find the Laplace transform of $\frac{1-e^{-t}}{t}$

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

16) Explain $f(x) = x + x^2$ as a fourier series in $-1 < x < 1$.

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17) a) Solve $\frac{dy}{dx} + xy = xy^3$

b) Solve $(D^3 - D^2 - D + 1)y = 0$

18) Solve $(D^2 - 6D + 9)y = x^2 + e^{3x} + \sin 3x$

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