

6222

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

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

1) Evaluate, $\int (e^x + 2\sin x + \frac{6}{\sqrt{1-x^2}}) .dx$

2) Evaluate, $\int \frac{1}{\sqrt{25-x^2}} .dx$

3) Evaluate, $\int_1^{\sqrt{3}} \frac{1}{1+x^2} .dx$

4) Find the mean value of $x+x^2$ over $[2,6]$

5) Find the Laplace Transform of $\cos^2 2t$.

6) Find $L^{-1} \left\{ \frac{s^2-3s+5}{s^3} \right\}$.

7) Write Euler's formulae to find coefficient of the Fourier series of $f(x)$ in the interval $(0, 2\pi)$

- *8) Find the differential equation to the family of curves $y = ae^{2x} + be^{-2x}$ where a, b are arbitrary constants.
- 9) Solve, $(9x + 5y - 9).dx + (5x + 7y - 4).dy = 0$.
- 10) Solve, $\frac{d^2y}{dx^2} - 8\frac{dy}{dx} + 12y = 0$.

PART-B

10x5=50M

- Instructions :**
- 1) Answer any **five** questions
 - 2) Each question carries **ten** marks
 - 3) Answer should be comprehensive and the criteria for valuation is the content but not the length of the answer.

11) a) Evaluate, $\int \sin^3 x \cos^6 x dx$

b) Evaluate, $\int \frac{1}{5 + 4\cos x} dx$

12) a) Evaluate, $\int x^2 \tan^{-1} x dx$

b) Evaluate, $\int_0^{\pi/2} \log(\tan x) dx$

13) a) Using the method of integration, find the area bounded by a circle of radius 'r'

b) Find the volume of the solid of revolution generated by revolving the area between $y = x^2 - 4$ and x-axis about x-axis.

14) a) Find $L \left[\frac{e^{2t} - e^{3t}}{t} \right]$.

b) Evaluate, $\int_0^1 \frac{1}{1+x^2} dx$ using Trapezoidal rule by taking 5 ordinates.

15) a) Find $L \left[e^{-t}(2\cos 3t - 3\sin 2t) \right]$

b) Find $L^{-1} \left[\frac{2s-3}{s^2+4s+20} \right]$

*16) a) Find the half range sine series for $f(x)=x$ in $(0, \pi)$.

b) Find the half range cosine series for $f(x)=x(2-x)$ in $0 < x < 2$.

17) a) solve, $\frac{dy}{dx} = \frac{y}{x} + \tan \frac{y}{x}$.

b) Solve $\frac{dy}{dx} + y \cot x = \operatorname{cosec} x$

18) a) solve, $(D^2 + 2D - 8)y = e^{-3x} + e^{-4x}$.

b) solve, $(D^2 + 4)y = x^2 - \cos 2x$.

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