3202

BOARD DIPLOMA EXAMINATION, (C-09)

MARCH / APRIL - 2019

COMMON - III SEMESTER EXAMINATION

ENGINEERING MATHEMATICS - II

Time : **3** Hours]   [Total Marks : **80**

PART - A   3×10=30

Instructions :   *(1) Answer **ALL** questions.*

*(2) Each question carries **THREE** marks.*

(3) Answer should be brief and straight to the point.

1   Evaluate $\int (3\cos x + 4\sin x - 5x)dx$.

2   Evaluate $\int \dfrac{e^{\sqrt{x}}}{\sqrt{x}}dx$.

3   Write the formula $\int \dfrac{1}{x^2-a^2}dx, \int \dfrac{1}{x^2+a^2}dx, \int \dfrac{1}{\sqrt{a^2-x^2}}dx$.

4 Write the formula for integration by parts.

5 Evaluate $\int \dfrac{dx}{\sqrt{25-x^2}}$.

6 Find the area bounded by the curve $y = x^2$, x-axis between x=1 and x=3.

7 Write the formula to find mean and R.M.S. values.

8 Write the formula to solve linear equation $\dfrac{dy}{dx} + Py = Q$.

9 Solve $\dfrac{dx}{x} + \dfrac{dy}{y} = 0$.

10 Form the differential equation of family of curves $y = A\cos x + B\sin x$. Where A, B are arbitrary constants.

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PART - B   10×5=50

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Instructions :   *(1)   Answer any **FIVE** questions.*

*(2)   Each question carries **TEN** marks.*

(3)   Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11 (i)   Evaluate $\int x^2 e^x dx$.

(ii) Evaluate $\int \dfrac{1}{3 + 2\cos x}$.

12 (i) Evaluate $\int \sin 8x \cdot \cos 3x \, dx$.

    (ii) Evaluate $\int \cos^2 \sin^3 \theta \, d\theta$.

13 (a) Find the area bounded by the parabola $y^2 = 4ax$ and its latus rectum.

    (b) Evaluate $\displaystyle\int_0^{\pi/2} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} \, dx$.

14 (a) Find the volume of the solid obtained by revolving the ellipse $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1$. About x-axis.

    (b) Find the R.M.S. value of $\sqrt{\log x}$ over the range $x = 1$ to $x = e$.

15 (a) Solve $\left(D^2 + 9\right)y = \cos 2x$.

    (b) Solve $\left(D^2 - 4D + 4\right)y = e^{5x}$.

16 (a) Solve $\dfrac{dy}{dx} = \dfrac{y}{x} + \sec \dfrac{y}{x}$.

    (b) Solve $\left(x^6 + 7y\right)dx + \left(y^6 + 7x\right)dy = 0$.

17 (a) Solve $\dfrac{dy}{dx} + \dfrac{y}{x} = x^2$.

  (b) Solve $\left(D^2 - 1\right)y = x$.

18 Evaluate $\displaystyle\int_{0}^{10} x^2\,dx$ using Trapezoidal rule with n=10.

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