



c09-c-302

3218

BOARD DIPLOMA EXAMINATION, (C-09)

OCT/NOV—2014

DCE—THIRD 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.

1. Evaluate :

$$\frac{dx}{\sqrt{5x^2 - 1}}$$

2. Evaluate :

$$\frac{x^2}{x^2 - 1} dx$$

3. Evaluate :

$$\frac{1}{\tan^{-1} x(1 - x^2)} dx$$

4. Evaluate :

$$xe^{-2x} dx$$

5. Find the function $y = f(x)$, if $\frac{dy}{dx} = \frac{1}{x^2}$, given $y = \frac{1}{2}$ when $x = 2$.

6. Find the volume of the solid formed by revolving the area bounded by the parabola $y^2 = 8x$ cut off by $x = 2$ about x -axis.

7. Find the mean value of the function $x = x^2$ in the interval $[2, 6]$.

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8. Solve :

$$(D^2 - 3D - 2)y = 0$$

9. Form the differential equation of family of curves $y = Ae^x + Be^{3x}$, where A, B are arbitrary constants.

10. Solve :

$$(e^y - 1)\cos x dx - e^y \sin x dy = 0$$

PART—B

10×5=50

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

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

11. Evaluate :

(a) $\int \frac{dx}{3x^2 - 5x - 7}$

(b) $\int x^2 \sin^{-1} x dx$

12. Evaluate :

(a) $\int \frac{x^{e-1} - e^{x-1}}{x^e - e^x} dx$

(b) $\int \frac{dx}{3\cos x - 4\sin x - 6}$

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13. (a) Find the volume of the solid generated by revolving the area enclosed between the parabolas $y^2 = 4ax$ and $x^2 = 4ay$ about x -axis.

(b) Find the RMS value of $\sqrt{8 - 4x^2}$ between $x = 0$ and $x = 2$.

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14. (a) Evaluate :

$$\int_0^1 \frac{x \sin x}{\cos^2 x} dx$$

(b) Find the area enclosed between the curve $y = x^2$ and the line $y = 3x - 4$.

15. (a) Solve :

$$\frac{dy}{dx} = y \cos x - \sin x \cos x$$

(b) Solve :

$$(D^2 - 1)y = \cosh 2x$$

16. (a) Solve :

$$(D^2 - 4)y = \sin 3x$$

(b) Solve :

$$(D^2 - 4D - 3)y = x^2$$

17. Solve $y^2 dx + (x^2 - xy) dy = 0$

18. (a) A curve is drawn to pass through the points given by the following table :

x	1	1.5	2	2.5	3	3.5	4
y	3	3.4	3.7	2.8	2.7	2.6	2.1

Calculate the area bounded by the curve, x -axis and the lines $x = 1, x = 4$ using Trapezoidal rule.

(b) Solve :

$$(x^2 - y) dx + (y^2 - x) dy = 0$$
