



C09-CHOT-302/C09-M-302

3246

BOARD DIPLOMA EXAMINATION, (C-09)

MARCH/APRIL—2014

DME—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.
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Evaluate $(x^3 - 3^x - 2) dx$.

2. Evaluate $\frac{[\cos^{-1} x]^5}{\sqrt{1-x^2}} dx$.

3. Evaluate $xe^x dx$.

4. Evaluate $\frac{2x-1}{(2x^2-2x-4)^7} dx$.

5. Evaluate $\frac{dx}{2x^2-7}$.

6. Find the volume of solid formed by revolving the area between the curve $y = x^2 - 1$ and the x -axis about x -axis.

7. Evaluate $\int_0^{\pi/4} \tan^4 x \sec^2 x dx$.

8. Form the differential equation of family of curves $y = A + Be^x$, where A, B are arbitrary constants.

9. Solve $x(1-y^2)dx - y(1-x^2)dy = 0$.

10. Solve $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} - 54y = 0$.

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PART—B

10×5=50

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

11. (a) Evaluate $\int \frac{1}{2 \sqrt{5x-4x^2}} dx$.
(b) Evaluate $\int \frac{1}{4 - 3 \sin x} dx$.
12. (a) Evaluate $\int \frac{1}{\sqrt{x-b} \sqrt{x-a}} dx$.
(b) Evaluate $\int \sin^4 x \cos^3 x dx$.
13. (a) Find the volume of the solid obtained by revolving the ellipse $\frac{x^2}{25} + \frac{y^2}{9} = 1$ about its major axis.
(b) Find the RMS value of $x^2 e^{2x}$ between 0 and 1.
14. (a) Evaluate $\int_0^{\pi/4} \log \frac{1 + \sin x}{1 - \sin x} dx$.
(b) Find the area bounded by the parabola $y^2 = 2x$ and the straight line $4x - y - 1 = 0$.
15. (a) Solve $\frac{dy}{dx} + y = e^x$.
(b) Solve $(D^2 - 5D - 6)y = e^x$.
16. Solve $\frac{dy}{dx} + y \tan x = y^2 \sec x$.
17. (a) Solve $(D^2 - D - 1)y = 2 \sin 3x$.
(b) Solve $(D^2 - 2D)y = x^2$.
18. (a) Evaluate $\int_0^1 \frac{dx}{x^2}$ using trapezoidal rule and hence find the value of $\int_0^1 \frac{dx}{x^2}$ by taking 5 ordinates.
(b) Solve $(x - y)^2 \frac{dy}{dx} = a^2$.
