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C09–CHOT–302/C09–M–302

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BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2013

DME—THIRD SEMESTER EXAMINATION

ENGINEERING MATHEMATICS—II

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

PART—A

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 :

$$\frac{1}{\sqrt{16 \quad x^2}}\,dx$$

2. Evaluate :

$$\frac{e^{\tan^{1} x}}{1 \quad x^2}\,dx$$

3. Evaluate :

$$(x^3 \quad 3^x \quad 2)\,dx$$

4. Evaluate :

$$2x \;\; e^{x^2}\,dx$$

5. Evaluate :

$$\frac{\sin^{1} x}{\sqrt{1 \quad x^2}}\,dx$$

6. Evaluate :

$$\int_{1/\sqrt{2}}^{\sqrt{3}/2} \frac{1}{\sqrt{1 \quad x^2}}\,dx$$

7. Find the area enclosed by the parabola $y \quad x^2$, the x-axis and the lines $x \quad 3$ and $x \quad 5$.

8. Solve :

$$\frac{d^2y}{dx^2} \quad 3\frac{dy}{dx} \quad 54y \quad 0$$

9. Form the differential equation of the family of curves $y \quad A\cos 3x \quad B\sin 3x$, where A, B are arbitrary constants.

10. Solve :

$$\sqrt{1 \quad y^2}\,dx \quad \sqrt{1 \quad x^2}\,dy \quad 0$$

PART—B

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 :

$$\frac{\sec^2 x}{\sqrt{1 \quad \tan^2 x}}\,dx$$

(b) Evaluate :

$$\frac{1}{5 \quad 4\cos x}\,dx$$

12. *(a)* Evaluate :

$$\frac{x}{x^2 \quad 3x \quad 2}\,dx$$

(b) Evaluate :

$$x^2 e^{5x}\,dx$$

13. *(a)* Find the volume of the solid formed by revolving the area enclosed by the circle $x^2 \quad y^2 \quad a^2$ about x-axis.

(b) Find the RMS value of $\sqrt{\log x}$ between $x \quad 1$ and $x \quad e$.

14. Find the area enclosed between the parabolas $y^2 \quad 16x$ and $x^2 \quad 16y$.

15. *(a)* Solve :

$$\frac{dy}{dx} \quad \frac{y}{x} \quad \frac{1}{x^5}$$

(b) Solve :

$$(D^2 \quad D \quad 6)y \quad e^x$$

16. Solve :

$$(x^2 \quad y^2)\,dx \quad 2xy\,dy \quad 0$$

17. Solve :

$$(D^2 \quad 3D \quad 2)y \quad x$$

18. *(a)* Obtain the value of

$$\int_0^1 \frac{dx}{1 \quad x^2}$$

using Simpson's rule by dividing the interval (0, 1) into 4 equal parts.

(b) Solve :

$$(ax \quad hy \quad g)\,dx \quad (hx \quad by \quad f)\,dy \quad 0$$

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