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C09–CM–302

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BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2013

DCM—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 :

$$x^4 \quad e^x \quad \frac{1}{x} \; dx$$

2. Evaluate :

$$e^{3 \;\; 5x} \, dx$$

3. Evaluate :

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

4. Evaluate :

$$x \sin x \, dx$$

5. Evaluate :

$$\frac{dx}{4 \quad x^2}$$

6. Write the formula to find the area bounded by $y \quad f(x)$, x-axis between $x \quad a$ and $x \quad b$.

7. Evaluate :

$$\int_0^1 (x^2 \quad 1) \, dx$$

8. Form the differential equation of family of curves $x^2 \quad y^2 \quad a^2$.

9. Solve :

$$x^3 dy \quad y^3 dx \quad 0$$

10. Find the particular integral of $(D^2 \quad 16)y \quad \sin 3x$.

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 :

$$\frac{(x \quad 7)}{(x \quad 3)(x \quad 2)}\,dx$$

(b) Evaluate :

$$x^2 e^{3x}\,dx$$

12. *(a)* Evaluate :

$$\cos 5x \;\; \sin 3x\,dx$$

(b) Evaluate :

$$\tan^5 x \;\; \sec^2 x\,dx$$

13. *(a)* Evaluate :

$$\int_0^{2} \frac{\sin^{10} x}{\sin^{10} x \quad \cos^{10} x}\,dx$$

(b) Using the method of integration, find the area bounded by $x^2 \quad y^2 \quad a^2$.

14. *(a)* Find the volume of the solid formed by revolving the area enclosed by the curve

$$\frac{x^2}{a^2} \quad \frac{y^2}{b^2} \quad 1$$

about x-axis.

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

15. *(a)* Solve :

$$\frac{dy}{dx} \quad \frac{2y}{x} \quad \frac{1}{x^3}$$

(b) Solve :

$$(D^2 \quad D \quad 12)\,y \quad e^{2x} \quad e^{3x}$$

16. *(a)* Solve :

$$(D^2 \quad 4D \quad 13)y \quad 3\sin 3x$$

(b) Solve :

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

17. Solve :

$$\frac{dy}{dx} \quad xy \quad xy^3$$

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 four equal parts.

(b) Solve :

$$(x^3 \quad y)dx \quad (y^4 \quad x)dy \quad 0$$

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