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C09–CM–302

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BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—2014

DCM—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) Answer should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Evaluate :

$$(e^{x} \quad \sin x \quad x^{4})\,dx$$

2. Evaluate :

$$e^{x}(\sin x \quad \cos x)\,dx$$

3. Evaluate :

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

4. Evaluate :

$$\frac{dx}{\sqrt{9 \quad x^{2}}}$$

5. Evaluate :

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

6. Evaluate :

$$\int_0^1 (x^3 \quad 1)\, dx$$

7. Write the formula to find the volume of solid of revolution of $y \quad f(x)$ between $x \quad a$ and $x \quad b$.

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

9. Solve :

$$(D^2 \quad 4D \quad 7)y \quad 0$$

10. Solve :

$$x^4 dy \quad y^4 dx \quad 0$$

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 :

$$\sin 7x \cos 2x \, dx$$

(b) Evaluate :

$$\cos^3 \quad \sin^4 \quad d$$

12. *(a)* Evaluate :

$$\frac{3x \quad 1}{(x \quad 1)(x \quad 2)} dx$$

(b) Evaluate :

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

13. *(a)* Find the volume of the solid obtained by revolving the ellipse $\frac{x^2}{a^2} \quad \frac{y^2}{b^2} \quad 1$ about x-axis, where $a \quad b$.

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

14. *(a)* Evaluate :

$$\int_0^{/2} \frac{\sin^7 x}{\sin^7 x \quad \cos^7 x} dx$$

(b) Find the area of the segment cut off from the parabola $y^2 \quad 8x$ by its latus rectum.

15. *(a)* Solve :

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

(b) Solve :

$$(D^2 \quad 2D \quad 1)y \quad 4e^{3x}$$

16. *(a)* Solve :

$$(D^2 \quad 1)y \quad \cos 3x$$

(b) Solve :

$$(D^2 \quad 2D \quad 1)y \quad x^2$$

17. Solve :

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

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 and hence find approximately the value of .

(b) Solve :

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

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