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C09–CM–302/C09–EC–302/C09–EE–302/C09–CH–302/
C09–CHST–302/C09–IT–302/C09–M–302/C09–MET–302/
C09–MNG–302/C09–PKG–302/C09–TT–302

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BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—2018

THIRD SEMESTER (COMMON) 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 :

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

2. Evaluate :

$$\frac{dx}{\sqrt{6 \quad 2x^{2}}}$$

3. Evaluate :

$$(x^{5} \quad \cos x \quad e^{x})\, dx$$

4. Evaluate :

$$xe^{x}\,dx$$

5. Evaluate :

$$(3 \quad 2x)^{5}\,dx$$

6. Find the volume generated by revolving about y-axis the area bounded by the $y \quad x^{3}$ under the line $y \quad 1$ between $x \quad 0$ and $x \quad 1$.

7. Find the mean value of the function $y \quad \sin x$ over $(0, \quad)$.

8. Solve :

$$\frac{d^{2}y}{dx} \quad 4y \quad 0$$

9. Solve :

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

10. Find the differential equation whose solution is $Ax^{2} \quad By^{2} \quad 1$ where A and B are arbitrary constants.

PART—B 10×5=50

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

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

11. *(a)* Evaluate :

$$\frac{x}{x^{2} \quad 12x \quad 35}\,dx$$

(b) Evaluate :

$$\frac{dx}{2 \quad \cos x}$$

12. *(a)* Evaluate :

$$\cos 3x \quad \sin 2x \, dx$$

(b) Evaluate :

$$\cos^{10} \quad \sin^{3} \quad d$$

13. *(a)* Evaluate :

$$\int_{0}^{\frac{}{2}} \frac{\sin^{n} x}{\sin^{n} x \quad \cos^{n} x} \, dx$$

(b) Find the area bounded by the curve $y \quad \sin x$, x-axis between the limits $x \quad x \quad 2$.

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

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

15. *(a)* Solve :

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

(b) Solve :

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

16. *(a)* Solve :

$$(D^2 \quad 4)y \quad \sin^{2} x$$

(b) Solve :

$$(D^2 \quad 5D \quad 4)y \quad 9 \quad x^2$$

17. Solve :

$$\frac{dy}{dx} \quad \frac{2x \quad y}{x \quad y}$$

18. *(a)* Evaluate $\int_1^2 \frac{1}{x}\,dx$ approximately by dividing the interval [1, 2] into 10 equal parts using Simpson's rule.

(b) Solve :

$$(y\cos x \quad \sin y \quad y)\,dx \quad (\sin x \quad x\cos y \quad x)\,dy \quad 0$$

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