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C09–PET–302

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BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2014

DECE—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 :

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

2. Evaluate :

$$\frac{dx}{\sqrt{4 \quad 6x}}$$

3. Evaluate $x \sin 2x \, dx$

4. Evaluate :

$$\frac{[\cos^{\ 1} x]^5}{\sqrt{1 \quad x^2}} dx$$

5. Evaluate :

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

6. Find the area bounded by the parabola $y \quad x^2$, x-axis and the abscissa $x \quad 4$.

7. Evaluate :

$$\int_0^{/3} \frac{\cos x}{4 \quad 3 \sin x} dx$$

8. Solve $(D^2 \quad 2D \quad 5)y \quad 0$.

9. Solve :

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

10. Form the differential equation of the family of curves, $Y \quad Ae^x \quad Be^{3x}$, where A, B are arbitrary constants.

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 :

$$\frac{1}{x^2 \quad 6x \quad 25}\,dx$$

(b) Evaluate :

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

12. *(a)* Evaluate :

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

(b) Evaluate :

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

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 its major axis, where $a \quad b$.

(b) Find the RMS value of $\sqrt{27 \quad 4x^2}$ between $x \quad 0, x \quad 3$.

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

15. *(a)* Solve :

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

(b) Solve :

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

16. *(a)* Solve :

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

(b) Solve :

$$(D^2 \quad 3D \quad 2)y \quad 5x^2$$

17. Solve :

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

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 :

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

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