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C09–C–302

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BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—2014

DCE—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 :

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

2. Evaluate :

$$(7x \quad 6)^{5}\,dx$$

3. Evaluate :

$$e^{x} \quad 2\sin x \quad \frac{6}{\sqrt{1 \quad x^{2}}}\,dx$$

4. Evaluate :

$$\frac{\cos\sqrt{x}}{\sqrt{x}}\,dx$$

5. Evaluate :

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

6. Evaluate :

$$\int_0^1 (x^8 \quad 1)\,dx$$

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

8. Solve :

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

9. Form the differential equation of family of curves $y \quad Ae^{2x} \quad Be^{\ 2x}$, where A and B are arbitrary constants.

10. Find the particular integral of $(D^2 \quad 16)y \quad \sin 4x$.

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 :

$$\int \frac{1}{x^2 \quad 4x \quad 13}\,dx$$

(b) Evaluate :

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

12. *(a)* Evaluate :

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

(b) Evaluate :

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

13. (a) Find the volume of the solid obtained by revolving the ellipse $\frac{x^2}{25} \quad \frac{y^2}{9} \quad 1$ about its major axis.

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

14. (a) Evaluate :

$$\int_0^{/2} \frac{\sin^6 x}{\sin^6 x \quad \cos^6 x}\,dx$$

(b) Find the area enclosed by the circle $x^2 \quad y^2 \quad a^2$ using integration.

15. (a) Solve :

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

(b) Solve :

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

16. (a) Solve :

$$\frac{dy}{dx} \quad \frac{3y}{x} \quad \frac{1}{x^4}$$

(b) Solve :

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

17. Solve :

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

18. (a) Use Simpson's rule to find the value of

$$\int_1^2 \frac{1}{x \quad 3}\,dx$$

taking five ordinates.

(b) Solve :

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

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