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C09–CHPC–302/C09–EC–302

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BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2013

DECE—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 :

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

2. Evaluate :

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

3. Evaluate :

$$\frac{dx}{\sqrt{25 \quad x^2}}$$

4. Evaluate :

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

5. Evaluate :

$$e^{5x \ 7} \, dx$$

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

7. Evaluate :

$$\int_{\frac{1}{\sqrt{3}}}^{\sqrt{3}} \frac{1}{1 \ x^2} \, dx$$

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

9. Find the particular integral of $(D^2 \ D \ 4)y \ e^{2x}$.

10. Solve :

$$\sqrt{(1 \ y^2)} \, dx \ \sqrt{(1 \ x^2)} \, dy \ 0$$

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 :

$$\frac{1}{(x^2 \quad 2x \quad 10)}\,dx$$

(b) Evaluate :

$$\frac{1}{3 \quad 2\cos x}$$

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 formed by revolving the area enclosed by the circle $x^2 \quad y^2 \quad a^2$ about x-axis.

(b) Find the mean value of $y \quad x^2 \quad 3x \quad 2$ between the limits $x \quad 1$ and $x \quad 2$.

14. *(a)* Evaluate :

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

(b) Find the area enclosed by the ellipse

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

15. *(a)* Solve :

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

(b) Solve :

$$(D^2 \quad 2D \quad 8)\,y \quad e^{\,3x}$$

16. Solve :

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

17. *(a)* Solve :

$$(D^2 \quad 8D \quad 9)\,y \quad \sin 3x$$

(b) Solve :

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

18. Evaluate $\int_0^1 x^2dx$ approximately by dividing the interval [0, 1] into 10 sub-intervals using Simpson's rule.

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