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C09–CHPC–302/C09–EC–302

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BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—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 $\frac{\sin^{1} x}{\sqrt{1 \quad x^2}}\,dx$

2. Evaluate $\sqrt{100 \quad x^2}\,dx$

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

4. Evaluate $x \sin(x^2)\,dx$

5. Evaluate $(e^x \quad \sin x \quad x^4)\,dx$

6. Evaluate $\int_{1}^{2} (x^2 \quad 1)\,dx$

7. Write the formulae to find RMS value of $y \quad f(x)$ in the interval $[a, b]$.

8. Form the differential equation of the parabola $y^2 \quad 4ax$.

9. Solve $\sqrt{1 \quad y^2}\,dx \quad \sqrt{1 \quad x^2}\,dy \quad 0$

10. Solve $\frac{d^2y}{dx^2} \quad 2\frac{dy}{dx} \quad 4y \quad 0$

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 $\dfrac{1}{\sqrt{x^2 \quad x \quad 1}}\,dx$

(b) Evaluate $x^2 e^{5x}\,dx$

12. *(a)* Evaluate $\dfrac{1}{x^2 \quad 8x \quad 25}\,dx$

(b) Evaluate $\dfrac{1}{4 \quad 5\cos x}\,dx$

13. *(a)* Find the volume of the solid obtained when the region $x^2 \quad y^2 \quad 16$ is revolved about a diameter.

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

14. Evaluate $\displaystyle\int_0^{/2} \frac{\sqrt{\tan x}}{\sqrt{\tan x} \quad \sqrt{\cot x}}\,dx$

15. *(a)* Solve $\dfrac{dy}{dx} \quad \dfrac{2y}{x} \quad 3x$

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

16. Solve $\dfrac{dy}{dx} \quad \dfrac{y}{x} \quad \cot\dfrac{y}{x}$

17. *(a)* Solve $(D^2 \quad 4)y \quad \sin 3x$

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

18. *(a)* Apply Simpson's rule to find the approximate area bounded by x-axis, between the lines $x \quad 1$ and $x \quad 4$ and the curve through the point :

X 1	1·5	2	2·5	3	3·5	4
Y 2	2·4	2·7	2·8	3	2·6	2·1

(b) Solve $(x^2 \quad y^2 \quad e^{2x})\,dx \quad 2xy\,dy \quad 0$

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