C09–CHOT–302/C09–M–302/
C09–RAC–302

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BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2014

DME—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 $\frac{1}{1 \quad \cos x}\,dx$.

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

3. Evaluate $e^x(\sin x \quad \cos x)\,dx$.

4. Evaluate $2x \quad e^{x^2}\,dx$.

5. Evaluate $\frac{\sin^{\ 1} x}{\sqrt{1 \quad x^2}}\,dx$.

6. Find the mean value of the function $x^2 \quad e^x$ in the interval [1, 3].

7. Find the area bounded the curve $y^2 \quad 4x$ between $x \quad 0$ and $x \quad 3$.

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

9. Solve $(D^2 \quad 18D \quad 77)y \quad 0$.

10. Solve $\frac{dy}{dx} \quad \sqrt{\frac{1 \quad y^2}{1 \quad x^2}}$.

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

(b) Evaluate $x \cot^{\quad 1} x\,dx$.

12. *(a)* Evaluate $\sin 5x \cos 2x\,dx$.

(b) Evaluate $\cos^3 \quad \sin^3 \quad d$.

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

14. *(a)* Find the volume of the solid formed by revolving the area enclosed by the curve $\sqrt{x} \quad \sqrt{y} \quad \sqrt{a}, x \quad 0, y \quad 0$ about y-axis.

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

15. *(a)* Solve $(D^2 \quad 4)y \quad \cos 2x$.

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

16. Solve $(x^2 \quad y^2)\,dx \quad 2xy\,dy \quad 0$.

17. *(a)* Solve $\frac{dy}{dx} \quad y \sec^2 x \quad \sin x \sec^3 x$.

(b) Solve $(D^2 \quad 7D \quad 6)y \quad e^{2x}$.

18. *(a)* Given $e \quad 1, e^1 \quad 2 \quad 72, e^2 \quad 7 \quad 39, e^3 \quad 20 \quad 09$ and $e^4 \quad 54 \quad 60$, verify Simpson's rule by finding the value of $\int_0^4 e^x dx$.

(b) Solve $\frac{dy}{dx} \quad \frac{a^2}{(x \quad y)}$.

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