3240

BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2014

DEEE—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.

1. Evaluate $\frac{e^{m\tan^{-1}x}}{1+x^2}dx$.

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

3. Evaluate $\sec^2(3x-1)\,dx$.

4. Evaluate $e^x - 2\sin x - \frac{6}{\sqrt{1-x^2}}\,dx$.

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

6. Evaluate $\int_{1/\sqrt{2}}^{\sqrt{3}/2} \frac{1}{\sqrt{1-x^2}}dx$.

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

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

9. Find the particular integral of $(D^2 \quad 1)y \quad \cos 3x$.

10. Form the differential equation of family of curves $x^2 \quad y^2 \quad a^2$.

PART—B 10×5=50

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

11. *(a)* Evaluate $\frac{1}{x^2 \quad 4x \quad 13} dx$.

(b) Evaluate $\frac{1}{(x \quad 1)(x \quad 2)} dx$.

12. *(a)* Evaluate $\frac{1}{\sqrt{x \quad b} \quad \sqrt{x \quad a}} dx$.

(b) Evaluate $\sin^4 x \ \cos^3 x \, dx$.

13. *(a)* Evaluate $\int_0 \frac{x \sin x}{1 \quad \cos^2 x} dx$.

(b) Find the area enclosed between the curve $y \quad x^2$ and the straight line $y \quad 3x \quad 4$.

14. *(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 x-axis.

(b) Find the RMS value of $\sqrt{\log x}$ between $x \quad e$ and $x \quad e^2$.

15. *(a)* Solve $\frac{dy}{dx}$ y $\cos x$.

(b) Solve $(D^2$ D $6)y$ e^x.

16. Solve $\frac{dy}{dx}$ $y \tan x$ $y^2 \sec x$.

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

(b) Solve $(D^2$ $4)y$ x^3.

18. *(a)* A river is 80 feet wide and the depth d in feet at a distance x from one bank is given by the following table :

x	0	10	20	30	40	50	60	70	80
d	0	4	7	9	12	15	14	8	3

Find the cross-section of the river using Simpson's rule.

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

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