C14–EE–301/C14–CHPP–301/C14–PET-301

4243

BOARD DIPLOMA EXAMINATION, (C–14)
OCT/NOV—2016
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.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Evaluate :

$$\int (e^x - 2\sin x - \frac{6}{\sqrt{1-x^2}})\,dx$$

2. Evaluate :

$$\int \frac{e^{\sin^{-1} x}}{\sqrt{1-x^2}}\,dx$$

3. Evaluate :

$$\int \sqrt{9-x^2}\,dx$$

4. Evaluate :

$$\int_0^{\pi/4} \sec^2 x\,dx$$

5. Find the mean value of $y = x^2 + 3x + 2$ between the limits $x = 1$ amd $x = 2$.

6. Form the differential equation of family of curves $y = Ae^x + Be^{5x}$, where A and B are arbitrary constants.

7. Solve :

$$(e^y + 1)\cos x \, dx + e^y \sin x \, dy = 0$$

8. Solve :

$$e^y \, dx + (xe^y + 2y)dy = 0$$

9. What is meant by dispersion? List various measures of dispersion.

10. Define covariance.

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PART—B   10×5=50

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

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

11. *(a)* Evaluate :

$$\int \sin^3 x \cos^6 x \, dx$$

(b) Evaluate :

$$\int \cos x \cos 2x \, dx$$

12. *(a)* Evaluate :

$$\int \frac{1}{x^2 + 2x + 5} \, dx$$

(b) Evaluate :

$$\int \frac{x}{(x+1)(x+3)} \, dx$$

13. *(a)* Evaluate :
$$\int x^3 e^{-4x}\, dx$$

(b) Evaluate :
$$\int_0^{\pi/2} \log \cot x\, dx$$

14. *(a)* Find the enclosed area between the curve $y = x^2$ and the straight line $y = 3x + 4$.

(b) Find the volume of the solid generated by revolving the ellipse
$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \quad \text{about } x\text{-axis, where } a > b.$$

15. *(a)* Find the RMS value of $\sqrt{\log x}$ between the limits $x = e$ and $x = e^2$.

(b) Find the value of $\displaystyle\int_1^5 \frac{1}{1+x}\, dx$ by Simpson's rule by dividing the range into 4 equal parts.

16. Solve :
$$xy^2\, dy - (x^3 + y^3)\, dx = 0$$

17. *(a)* Solve :
$$(6x + y - 1)dx + (10y + x - 1)dy = 0$$

(b) Solve :
$$\frac{dy}{dx} + xy = xy^3$$

18. *(a)* Find the median of the following frequency table :

Life (100 hrs)	0–4	4–8	8–12	12–16	16–20	20–24	24–28	28–32
No. of lamps	4	12	40	41	27	13	9	4

(b) The scores of a cricket player in the last 10 innings are 58, 59, 60, 65, 54, 66, 52, 75, 69 and 52. Find the standard deviation (SD).

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