* 4243 *

C14–EE–301/C14–CHPP–301/C14–PET–301

4243

BOARD DIPLOMA EXAMINATION, (C–14)

MARCH/APRIL—2017

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 :

$$(\text{cosec}^2 x \quad a^x \quad \cos x)\, dx$$

2. Evaluate :

$$\frac{\cos(\log x)}{x}\, dx$$

3. Evaluate :

$$e^x \; \frac{1 \quad x\log x}{x} \; dx$$

4. Evaluate :

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

5. Evaluate :

$$\int_0^{\pi/3} \frac{\cos x}{1 + \sin x}$$

6. Solve :

$$\frac{dy}{dx} + \frac{y}{x}$$

7. Find the differentiate equation corresponding to $y = A + Be^{-x}$, where A and B are arbitrary constants.

8. Solve :

$$\frac{dy}{dx} + y = 2x$$

9. Find the median of the following data :

50, 60, 100, 75, 90, 80, 95, 85, 45, 70, 55

10. Find the range and coefficient of range from the following table :

Size	0–10	10–20	20–30	30–40
Frequency	5	8	12	15

PART—B

10×5=50

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

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

11. *(a)* Evaluate :

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

(b) Evaluate :

$$x^3 \log x \, dx$$

12. (a) Evaluate :

$$\sin 3x \cos x \, dx$$

(b) Evaluate :

$$\frac{1}{5 \quad 4\cos x} \, dx$$

13. (a) Evaluate :

$$\cos^{10} \quad \sin^3 \quad d$$

(b) A curve is drawn to pass through the points given by the following table :

x	1	1·5	2	2·5	3	3·5	4
y	2	2·4	2·7	2·8	3	2·6	2·1

Using Simpson's rule, find the approximate area bounded by the curve, the x-axis and the lines x 1 and x 4.

14. (a) Find the area between curves y^2 4x and x^2 4y.

(b) Find the RMS value of $\sqrt{\log x}$ over the range x 1 to x e.

15. (a) Evaluate :

$$_0 \frac{x}{1 \quad \sin x} \, dx$$

(b) Find the volume of the solid generated, when the area bounded by the curve y x^2 1 and x-axis is rotated about x-axis.

16. Solve :

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

17. *(a)* Solve :

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

(b) Solve :

$$(ax \quad hy \quad g)dx \quad (hx \quad by \quad f)dy \quad 0$$

18. Calculate the correlation coefficient for the following heights in inches of fathers (X) and their sons (Y) :

X	65	67	66	71	70
Y	58	60	70	69	61

★ ★ ★