



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 :

$$(\operatorname{cosec}^2 x \ a^x \ \cos x) dx$$

2. Evaluate :

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

3. Evaluate :

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

4. Evaluate :

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

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5. Evaluate :

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

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.

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11. (a) Evaluate :

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

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(b) Evaluate :

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

12. (a) Evaluate :

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

(b) Evaluate :

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

13. (a) Evaluate :

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

(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 :

$$\int_0^1 \frac{x}{\sin x} \, dx$$

(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.

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16. Solve :

$$(y^2 - 2xy)dx + (2xy - x^2)dy = 0$$

17. (a) Solve :

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

(b) Solve :

$$(ax^2 + by + g)dx + (hx^2 + cy + f)dy = 0$$

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

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