



C14-C-301/C14-CM-301

4225

BOARD DIPLOMA EXAMINATION, (C-14)

OCT/NOV—2016

DCE—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 :

$$(\sec^2 x + e^x + \sin x) dx$$

2. Evaluate :

$$\frac{1}{x(\log x)^2} dx$$

3. Evaluate :

$$\frac{1}{9 + x^2} dx$$

4. Evaluate :

$$\int_1^2 (x^2 + 1) dx$$

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5. Find the mean value of $y = x^2$ between $x = 2$ and $x = 3$.

6. Solve :

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

7. Find the differential equation for $y = A \cos x + B \sin x$, where A and B are arbitrary constants.

8. Solve :

$$\frac{dy}{dx} = \frac{y}{x} + 5$$

9. Write the formulas to find the arithmetic mean of—

- (a) ungrouped distribution;
- (b) grouped frequency distribution.

10. Find the mean deviation from arithmetic mean of 6, 7, 10, 8, 17, 11.

PART—B

10×5=50

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

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

11. (a) Evaluate :

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

(b) Evaluate :

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

12. (a) Evaluate :

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

(b) Evaluate :

$$\int \frac{1}{(x-1)(x-2)} \, dx$$

13. (a) Evaluate ^{*} :

$$x^2 e^x dx$$

(b) Prove that

$$\int_0^{\pi/2} \frac{\sqrt{\cos x}}{\sqrt{\cos x} \sqrt{\sin x}} dx = \frac{\pi}{4}$$

14. (a) Find the area bounded by the circle $x^2 + y^2 = a^2$ using integration.

(b) Find out volume of solid of the revolution generated by revolving the area enclosed between the curve $y = x^2 + 1$ and x -axis about x -axis.

15. (a) Find the RMS value of xe^x between $x = 0$ to $x = 1$.

(b) Evaluate

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

using trapezoidal rule by taking $n = 4$.

16. Solve :

$$(x^2 + y^2) \frac{dy}{dx} = xy$$

17. (a) Solve :

$$(ax + hy + g)dx + (hx + by + f)dy = 0$$

(b) Solve :

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

18. Find the quartile deviation and coefficient of quartile deviation of the following data :

Age in Years	:	10	15	20	25	30	35	40
Number of Persons	:	5	10	16	20	14	8	4
