



C14-C-301/C14-CM-301

4225

BOARD DIPLOMA EXAMINATION, (C-14)
MARCH/APRIL—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 :

$$\int (x^9 e^x \frac{5}{x}) dx$$

2. Evaluate :

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

3. Evaluate :

$$\int \frac{1}{x(1 - \log x)^5} dx$$

4. Evaluate :

$$\int_1^1 (x^2 - 3x - 2) dx$$

5. Find the area of the region bounded by the parabola $y = x^2$, x -axis between the lines $x = 2$ and $x = 3$ about the x -axis.

6. Form a differential equation by eliminating the arbitrary constants c , from the equation $\sin^{-1} x = \sin^{-1} y + c$.

7. Solve :

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

8. Solve :

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

9. Find the mean deviation from median of the following discrete data :

6, 10, 7, 12, 4, 13, 12, 16

10. Find the mean, variance and standard deviation for the following data :

6, 7, 10, 12, 13, 4, 12, 8

PART—B

10×5=50

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

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

11. (a) Evaluate :

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

(b) Evaluate :

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

12. (a) Evaluate :

$$\frac{1}{3 \cos x - 4 \sin x - 6} dx$$

(b) Evaluate :

$$\cos 7x \cdot \sin 2x dx$$

13. (a) Evaluate*

$$\int x^3 e^{2x} dx$$

by making use of Bernoulli's theorem.

(b) Evaluate :

$$\int_0^{\pi/2} \frac{\sqrt{\tan x}}{\sqrt{\tan x} \sqrt{\cot x}} dx$$

14. (a) Find the area enclosed by the curve $9x^2 + 4y^2 = 36$.

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

15. (a) Find the RMS value of the current $I = a \sin x$ over a half wave.

(b) Evaluate

$$\int_4^8 \frac{1}{x} dx$$

approximately by dividing the interval [4, 8] into four equal parts using trapezoidal rule.

16. Solve :

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

17. (a) Solve :

$$\frac{dy}{dx} = y \tan x + \sec x$$

(b) Solve :

$$(x^3 + y)dx - (y^3 + x)dy = 0$$

18. The following table shows the marks obtained by six students in Chemistry and Physics :

| | | | | | | |
|--------------------|------|----|----|----|----|----|
| Marks in Chemistry | : 9 | 16 | 18 | 15 | 21 | 12 |
| Marks in Physics | : 14 | 17 | 13 | 13 | 16 | 15 |

Calculate the correlation coefficient.
