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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 :

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

2. Evaluate :

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

3. Evaluate :

$$\frac{1}{x(1 \quad \log x)^5}\, dx$$

4. Evaluate :

$$\int_{1}^{1} (x^2 \quad 3x \quad 2)dx$$

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

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

7. Solve :

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

8. Solve :

$$\frac{dy}{dx} \quad y \quad e^{x}$$

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 :

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

(b) Evaluate :

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

12. *(a)* Evaluate :

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

(b) Evaluate :

$$\cos 7x . \sin 2x \, dx$$

13. *(a)* Evaluate

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

by making use of Bernoulli's theorem.

(b) Evaluate :

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

14. *(a)* Find the area enclosed by the curve $9x^2 \quad 4y^2 \quad 36$.

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

15. *(a)* Find the RMS value of the current $I \quad a \sin x$ 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 :

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

17. *(a)* Solve :

$$\frac{dy}{dx} \quad y \tan x \quad \sec x$$

(b) Solve :

$$(x^3 \quad y)dx \quad (y^3 \quad x)dy \quad 0$$

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.

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