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C14–M–301/C14–CHOT–301/C14–RAC–301

4249

BOARD DIPLOMA EXAMINATION, (C–14)

MARCH/APRIL—2017

DME—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 :

$$(x^a \quad a^x \quad ax)\,dx$$

2. Evaluate :

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

3. Evaluate :

$$\frac{1}{\sqrt{16 \quad x^2}}\,dx$$

4. Evaluate :

$$\int_0^1 (x^3 \quad 1)dx$$

5. Find the area enclosed by the parabola $y \quad x^2$, the X-axis and the lines $x \quad 3$ and $x \quad 5$.

6. Find the differential equation of the family of parabolas $y^2 \quad 4ax$.

7. Solve :

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

8. Solve :

$$\frac{dy}{dx} \quad \frac{y}{x} \quad 5$$

9. The weekly wages of 5 labourers are ₹ 40, ₹ 60, ₹ 36, ₹ 45, ₹ 25. Calculate their AM.

10. Define positive and negative correlation.

PART—B 10×5=50

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

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

11. *(a)* Evaluate :

$$\cos^3 \quad \sin^6 \quad d$$

(b) Evaluate :

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

12. *(a)* Evaluate :

$$\frac{x}{x^2 \quad 12x \quad 35} dx$$

(b) Evaluate :

$$\frac{1}{1 \quad \cos x} dx$$

13. *(a)* Evaluate :

$$x^3 e^{4x} dx$$

(b) Evaluate :

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

14. *(a)* Find the area bounded by the parabola $4y \quad 3x^2$ and the line $2y \quad 3x \quad 12$.

(b) Find the RMS value of $\sqrt{27 \quad 4x^2}$ from $x \quad 0$ to $x \quad 3$.

15. *(a)* Find the volume generated by the revolution of the ellipse $\frac{x^2}{25} \quad \frac{y^2}{9} \quad 1$ about the major axis.

(b) Evaluate $\int_0^1 x^2 dx$ approximately by dividing the interval (0, 1) into 10 equal subintervals using Simpson's rule.

16. Solve :

$$(x^2 \quad y^2)dx \quad 2xydy$$

17. *(a)* Solve :

$$(x^2 \quad y^2 \quad a^2)xdx \quad (x^2 \quad y^2 \quad b^2)ydy \quad 0$$

(b) Solve :

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

18. Find the variance and standard deviation for the following data :

Marks	10	20	30	40	50	60
No. of students	8	12	20	10	7	3

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