



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 :

$$(x^a - a^x - ax) dx$$

2. Evaluate :

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

3. Evaluate :

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

4. Evaluate :

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

/4249

1

[Contd...

WWW.MANARESULTS.CO.IN

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

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

7. Solve :

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

8. Solve :

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

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 :

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

(b) Evaluate :

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

12. (a) Evaluate :

$$\int \frac{x}{x^2 - 12x + 35} \, dx$$

(b) Evaluate :

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

13. (a) Evaluate ^{*} :

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

(b) Evaluate :

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

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

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

15. (a) Find the volume generated by the revolution of the ellipse $\frac{x^2}{25} + \frac{y^2}{9} = 1$ 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 :

$$(x^2 - y^2)dx - 2xydy$$

17. (a) Solve :

$$(x^2 - y^2 - a^2)xdx - (x^2 - y^2 - b^2)ydy = 0$$

(b) Solve :

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

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
