



C14-C-301/C14-CM-301

4225

BOARD DIPLOMA EXAMINATION, (C-14)
OCT/NOV—2015
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 :

$$(x^9 - 9^x - 9x) dx$$

2. Evaluate :

$$\frac{1}{x^2 - 81} dx$$

3. Evaluate :

$$\frac{\sin \sqrt{x}}{\sqrt{x}} dx$$

4. Evaluate :

$$\int_0^4 |x - 2| dx$$

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

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6. Find the differential equation by eliminating the arbitrary constants A, B from the equation $y = Ae^{3x} + Be^{2x}$.

7. Solve :

$$y \sqrt{1 - X^2} dy + x \sqrt{1 - Y^2} dx = 0$$

8. Solve :

$$(2x - y + 1)dx + (2y - x + 8)dy = 0$$

9. Find the quartile deviation of the daily wages (in ₹) of 7 persons given below :

12, 7, 15, 10, 19, 17, 25

10. Calculate mean value for the following distribution :

| | | | | | |
|-------|---|----|----|----|----|
| x_i | 3 | 9 | 17 | 23 | 27 |
| f_i | 8 | 10 | 12 | 9 | 5 |

PART—B

10×5=50

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

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

11. (a) Evaluate :

$$\int \cos^3 x \sin^7 x dx$$

(b) Evaluate :

$$\int \frac{x - 1}{(x - 4)(x - 7)} dx$$

12. (a) Evaluate :

$$\int x^4 \sin 2x dx$$

(b) Evaluate :

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

13. (a) Evaluate ^{*} :

$$\int \frac{1}{(1 - e^x)(1 + e^{-x})} dx$$

(b) Evaluate :

$$\int_0^1 \frac{(\tan^{-1} x)^2}{1 - x^2} dx$$

14. (a) Find the volume of the solid formed by revolving the area enclosed by the circle $x^2 + y^2 = a^2$ about x -axis.

(b) Evaluate :

$$\int_0^{\pi/2} \frac{a \sin x - b \cos x}{\sin x \cos x} dx$$

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

(b) Evaluate

$$\int_0^1 \frac{dx}{x^2}$$

using Simpson's rule by dividing the interval (0, 1) into four equal parts and hence, find approximately the value of .

16. (a) Solve :

$$(1 - x^2) \frac{dy}{dx} - 2xy = \frac{1}{\sqrt{1 - x^2}}$$

(b) Solve :

$$(y^2 - 2xy) dx + (2xy - x^2) dy = 0$$

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17. Solve $xy^2 dy + (x^3 - y^3) dx = 0$ as a homogenous differential equation of I order.

18. From the prices of shares x and y given below for 10 days of sharing, find out which share is more stable :

X : 55 54 52 53 56 58 52 50 51 49

Y : 108 107 105 105 106 107 104 103 104 101
