



C14-EC-301/C14-CHPC-301/C14-PCT-301

4237

BOARD DIPLOMA EXAMINATION, (C-14)

OCT/NOV—2015

DECE—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.  
(3) Answer should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Evaluate :

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

2. Evaluate :

$$\frac{1}{\sin^2 x \cdot \cos^2 x} dx$$

3. Evaluate :

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

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4. Evaluate : \*

$$\int_0^{\pi/3} \frac{\cos x}{4 - 3 \sin x} dx$$

5. Find the mean value of the curve  $y^2 = 4ax$  in the interval  $[0, 4]$ .

6. Form the differential equation for  $y = Ae^{2x} + Be^{-2x}$ , where  $A$  and  $B$  are arbitrary constants.

7. Solve :

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

8. Solve :

$$(\sin y - y \sin x) dx + (\cos x - x \cos y) dy = 0$$

9. List the measures of central tendency and find any two of them for the data

5, 6, 9, 10, 6, 12, 3, 6, 11, 10, 4, 6, 7

10. Define the correlation between two variables and mention the types of correlation with examples.

### PART—B

10×5=50

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

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

11. (a) Evaluate :

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

(b) Evaluate :

$$\int \frac{dx}{\sqrt{x^2 - 2x - 2}}$$

12. (a) Evaluate <sup>\*</sup> :

$$\int \sin^3 x \cos^4 x dx$$

(b) Evaluate :

$$\int \frac{dx}{(x^2 - a^2)(x^2 - b^2)}$$

13. (a) Evaluate :

$$\int \frac{dx}{5 - 4 \sin x}$$

(b) Evaluate :

$$\int_0^{\pi/2} \frac{\sqrt{\cos x}}{\sqrt{\cos x} \sqrt{\sin x}} dx$$

14. (a) Evaluate :

$$\int_{\pi/4}^{\pi/2} \log \frac{1 + \sin x}{1 - \sin x} dx$$

(b) Find the area enclosed by the curve  $y^2 = 4ax$ , X-axis and its latusrectum

<sup>\*</sup> 15. (a) Find the volume of solid obtained by revolving the ellipse

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \text{ about the X-axis.}$$

(b) Evaluate  $\int_1^2 x^2 dx$  using the trapezoidal rule by taking  $n=10$ .

16. Solve the equation  $(x^2 + y^2)dx - 2xydy = 0$ .

17. (a) Solve : \*

$$(1 - x^2) \frac{dy}{dx} - 2xy = x^3$$

(b) Solve :

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

18. (a) Find the mean deviations about (i) mean, (ii) median for the following data :

12, 34, 5, 60, 120, 18, 24, 50, 3, 15, 9, 8

(b) Calculate the Karl Pearson's coefficient of correlation for the following data :

X	6	8	12	15	18	20	24	28	31
Y	10	12	15	15	18	25	22	26	28

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