



C14-EE-301/C14-CHPP-301/C14-PET-301

4243

BOARD DIPLOMA EXAMINATION, (C-14)
OCT/NOV—2015
DEEE—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) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Evaluate :

$$\int (3x^3 - 4x^2 + 5x - 7) dx$$

2. Evaluate :

$$\int \frac{1}{16x^2 - 9} dx$$

3. Evaluate :

$$\int \frac{e^{m \tan^{-1} x}}{1 + x^2} dx$$

4. Evaluate :

$$\int_0^2 x^2 e^{-2x} dx$$

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5. Find the mean value of $f(x) = \frac{1}{1-x^2}$ in $(0, 1)$.

6. Form the differential equation for $y = A \cos 3x + B \sin 3x$, where A and B are arbitrary constants.

7. Solve :

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

8. Solve :

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

9. List the measures of dispersion and find the range of the following data :

60, 50, 85, 90, 70, 40, 110, 130, 120, 100

10. What is correlation coefficient? Write the formula of Karl Pearson correlation coefficient for two variables X and Y and mention two of its properties.

PART—B

10×5=50

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

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

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. (a) Evaluate :

$$\int \cos 4x \cos 2x \, dx$$

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(b) Evaluate :

$$\int \frac{dx}{3x^2 - 2x - 5}$$

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12. (a) Evaluate :

$$\int \sin^3 x \cos^{10} x \, dx$$

(b) Evaluate :

$$\int x \tan^{-1} x \, dx$$

13. (a) Evaluate :

$$\int \frac{dx}{13 - 12 \cos x}$$

(b) Evaluate :

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

14. (a) Evaluate :

$$\int_1^3 \log \frac{3-x}{3-x} dx$$

(b) Find the area bounded by the curve $y = x^2 - 8x + 15$ and X-axis.

15. (a) Find the volume of the paraboloid generated by revolving the parabola $y^2 = 4ax$ about X-axis from $x = 0$ to $x = h$.

(b) Obtain the value of $\int_0^1 \frac{dx}{x^2}$ using the Simpson's 1/3rd rule by dividing the interval (0, 1) into four equal parts.

16. Solve :

$$x^2 y \, dx - (x^2 - y^3) \, dy = 0$$

17. (a) Solve :

$$\frac{dy}{dx} = 3x^2 y - x^2$$

(b) Solve :

$$\frac{dy}{dx} = xy - xy^3$$

- * **18.** (a) The goals scored by two teams *A* and *B* in a football season are as follows :

Number of goals scored in match	Number of matches	
	Team A	Team B
0	27	17
1	9	9
2	8	6
3	5	5
4	4	3

Find the team which is more consistent from the above data.

- (b) Two judges in a beauty competition rank the 12 entries as follows :

<i>x</i>	1	2	3	4	5	6	7	8	9	10	11	12
<i>y</i>	12	9	6	10	3	5	4	7	8	2	11	1

Find the degree of agreement between the two judges.
