



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

4237

BOARD DIPLOMA EXAMINATION, (C-14)

OCT/NOV—2016

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.

1. Evaluate :

$$\int \sqrt{1 - \sin 2x} \, dx$$

2. Evaluate :

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

3. Evaluate :

$$\int x^2 e^x \, dx$$

4. Evaluate : *

$$\int_0^1 (x^{10} - 1) dx$$

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

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

7. Solve :

$$x^6 dy - y^6 dx = 0$$

8. Solve :

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

9. Find the median and mean of 46, 64, 87, 41, 58, 77 and 35.

10. Calculate the variance of 1, 5, 6, 4, 7 and 13.

PART—B

10×5=50

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

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

11. (a) Evaluate :

$$\int \cos 7x \cos 2x \, dx$$

(b) Evaluate :

$$\int \sin^5 x \cos^3 x \, dx$$

12. (a) Evaluate ^{*} :

$$\frac{1}{x^2 - 8x + 20} dx$$

(b) Evaluate :

$$\frac{x + 7}{(x - 2)(x + 3)} dx$$

13. (a) Evaluate :

$$x \sin 2x dx$$

(b) Prove that

$$\int_0^{\pi/2} \frac{\sin x}{\sin x + \cos x} dx = \frac{\pi}{4}$$

14. (a) Find the area enclosed between the two parabolas $y^2 = 4x$ and $x^2 = 4y$.

(b) Find the volume of the solid formed by revolving the area enclosed by the curve $y = x^3$, the y -axis and the lines $y = 0$ and $y = 8$ about the y -axis.

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

(b) A curve is drawn to pass through the points given in the following table :

x	1	1.5	2	2.5	3	3.5	4
y	3	3.4	3.7	2.8	2.7	2.6	2.1

Calculate the area bounded by the curve, x -axis and the lines $x = 1$ and $x = 4$ using Simpson's rule.

16. Solve :

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

17. (a) Solve : *

$$(x - y - 2)dx + (x + y - 4)dy = 0$$

(b) Solve :

$$\frac{dy}{dx} = y \tan x + \sec x$$

18. Find the quartile deviation and also mean deviation from mean for the following data :

x	4	8	11	17	20	24	32
f	3	5	9	5	4	3	1

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