



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

4237

BOARD DIPLOMA EXAMINATION, (C-14)
MARCH/APRIL—2017
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 :

$$\int \frac{\cos^{-1} x}{\sqrt{1 - x^2}} \, dx$$

3. Evaluate :

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

4. Evaluate :

$$\int_0^{\pi} \sin 3x \, dx$$

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5. Evaluate :

$$\int_1^1 (3x^2 - 5) dx$$

6. Form the differential equation by eliminating the arbitrary constant 'C' from $\sin^{-1} x = \sin^{-1} y + C$.

7. Solve :

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

8. Solve :

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

9. Find the range and coefficient of range of the following distribution :

X	5	6	7	9	12	13	14	15
F	10	13	22	30	20	18	15	11

10. Find the standard deviation of height of 10 students given by 60, 60, 61, 62, 63, 63, 63, 64, 64, 70.

PART—B

10×5=50

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

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

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11. (a) Evaluate :

$$\int \frac{1}{x^2 + 4x + 13} dx$$

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(b) Evaluate :

$$x^2 \cos 2x \, dx$$

12. (a) Evaluate :

$$\sin^2 x \cos^3 x \, dx$$

(b) Evaluate :

$$\frac{x}{(x-1)(x-3)} \, dx$$

13. (a) Evaluate :

$$\frac{1}{3-4\cos x} \, dx$$

(b) Obtain the value of

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

by Simpson's rule with four equal intervals. Hence find the approximate value of .

14. (a) Find the volume of the sphere of radius r using method of integration.

(b) Find the mean value of $y = \sin x$ over $[0, 2\pi]$.

15. (a) Evaluate :

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

(b) Find the area enclosed by the curve $y = x^2$ and the line $2x - y - 3 = 0$.

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16. Solve :

$$y^2 - (xy - y^2) \frac{dy}{dx} = 0$$

* 17. (a) Solve :

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

(b) Solve :

$$(x^3 - xy^2 - a^2x)dx + (x^2y - y^3 - b^2y)dy = 0$$

18. Calculate the correlation coefficient from the following data :

X	8	6	3	5	1	15	12
Y	7	5	4	9	4	17	14
