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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 :

$$\sqrt{1 \quad \sin 2x}\, dx$$

2. Evaluate :

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

3. Evaluate :

$$x^2 e^x dx$$

4. Evaluate :

$$_0 \sin 3x\, dx$$

5. Evaluate :

$$\int_{1}^{1} (3x^2 \quad 5)\, dx$$

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

7. Solve :

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

8. Solve :

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

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.

11. *(a)* Evaluate :

$$\frac{1}{x^2 \quad 4x \quad 13}\, dx$$

(b) Evaluate :

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

12. (a) Evaluate :

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

(b) Evaluate :

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

13. (a) Evaluate :

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

(b) Obtain the value of

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

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 $y \quad \sin x$ over $[0, 2 \ ]$.

15. (a) Evaluate :

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

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

16. Solve :

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

17. *(a)* Solve :

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

(b) Solve :

$$(x^3 \quad xy^2 \quad a^2x)dx \quad (x^2y \quad y^3 \quad b^2y)dy \quad 0$$

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

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