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C14–EE–301/C14–CHPP–301/C14–PET–301

4243

BOARD DIPLOMA EXAMINATION, (C–14)

MARCH/APRIL—2016

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.

1. Evaluate :

$$\frac{x^2 \quad 2x \quad 3}{x^4}\,dx$$

2. Evaluate :

$$\frac{1}{1 \quad \sin x}\,dx$$

3. Evaluate :

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

4. Evaluate :

$$\int_{/2}^{/2} x^2 \sin x\,dx$$

5. Find the RMS value of $\sqrt{8 \quad 4x^2}$ between $x \quad 0$ to $x \quad 2$.

6. Form the differential equation from $xy \quad ae^x \quad be^{\ x}$, where a and b are arbitrary constants.

7. Solve :

$$\frac{dy}{dx} \quad \frac{1 \quad y^2}{1 \quad x^2}$$

8. Show that $(x^4 \quad 2xy^2 \quad y^4)dx \quad (2x^2y \quad 4xy^3 \quad \sin y)dy \quad 0$ is an exact differential equation.

9. What is measure of dispersion? List the measures of dispersion.

10. Explain the types of correlation and write the formula for Karl Pearson correlation coefficient.

PART—B

10×5=50

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

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

11. *(a)* Evaluate :

$$\sin^7 x \ \cos^5 x \ dx$$

(b) Evaluate :

$$\frac{dx}{1 \quad \sin x \quad \cos x}$$

12. *(a)* Evaluate :

$$\sin 13x \ \sin 8x \ dx$$

(b) Evaluate :

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

13. *(a)* Evaluate :

$$\frac{x}{(x \quad 1)(2x \quad 1)} dx$$

(b) Evaluate :

$$\int_0^3 \frac{\sqrt{x}}{\sqrt{x} \quad \sqrt{3 \quad x}} dx$$

14. *(a)* Evaluate :

$$\int_{-1}^{1} \frac{x \sin^{-1} x}{\sqrt{1 \quad x^2}} dx$$

(b) Find the area enclosed between the parabolas $y^2 \quad 4x$ and $x^2 \quad 4y$.

15. *(a)* Find the volume of the solid formed by revolving the area enclosed by the curve $y \quad x^3$, the Y-axis and the lines $y \quad 8$, $y \quad 0$ about Y-axis.

(b) A curve is drawn passing through the points given by 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 $x \quad 1$, $x \quad 4$ approximately using Simpson's 1/3rd rule.

16. Solve :

$$\frac{dy}{dx} \quad \frac{y \quad x \cos \frac{y}{x} \quad y \sin \frac{y}{x}}{x \quad y \sin \frac{y}{x} \quad x \cos \frac{y}{x}}$$

17. *(a)* Solve :

$$\frac{dy}{dx} \quad y \cot x \quad \cos x$$

(b) Solve :

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

18. *(a)* Compute the standard deviation and variance of the following data :

X	11	12	13	14	15	16	17	18	19
F	3	10	34	25	15	7	5	4	2

(b) The marks obtained by 10 students in English and Mathematics are given below :

English	2	1	3	4	5	6	7	10	9	8
Mathematics	1	4	2	5	3	9	7	8	6	10

Calculate Spearman's coefficient of correlation and interpret the result.

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