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C14–A–301/C14–AA–301/C14–AEI–301/C14–CH–301/
C14–CHST–301/C14–IT–301/C14–MET–301/
C14–MNG–301/C14–TT–301/C14–BM–301

4201

BOARD DIPLOMA EXAMINATION, (C–14)

MARCH/APRIL—2016

THIRD SEMESTER (COMMON) 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 $(e^x \quad \sin x \quad \frac{2}{\sqrt{1 \quad x^2}})\,dx.$

2. Evaluate $\frac{1}{\sqrt{x^2 \quad 9}}\,dx.$

3. Evaluate $\frac{\cos x \quad \sin x}{\cos x \quad \sin x}\,dx.$

4. Evaluate $\int_1^2 (x \quad 1)(x \quad 2)dx.$

5. Find the volume of solid obtained by rotating the portion of the parabola $y \quad x^2$ between $x \quad 0$ and $x \quad 2$ about the x-axis.

6. Form the differential equation of family of curves $y \quad Ae^{3x} \quad Be^{\ 5x}$ where A, B are arbitrary constants.

7. Solve :

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

8. Solve :

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

9. Find the arithmetic mean and median of 46, 64, 87, 41, 58, 77, 35, 90, 55, 92, 33.

10. Find the standard deviation of the data 12, 16, 18, 24, 26, 30.

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

(b) Evaluate $\int \cos 7x . \cos 2x\, dx.$

12. *(a)* Evaluate $\int \frac{1}{(x^2 \quad 9)(x^2 \quad 13)}\, dx.$

(b) Evaluate $\int x \sin^{\ 1} x\, dx.$

13. *(a)* Evaluate $\int \frac{1}{4 \quad 5\cos x}\, dx$.

(b) Evaluate $\int_{0}^{/2} \frac{\sqrt{\cos x}}{\sqrt{\cos x} \quad \sqrt{\sin x}}\, dx$.

14. *(a)* Find the area enclosed between the parabolas $y^2 \quad 4ax$ and $x^2 \quad 4ay$.

(b) Find the volume of the solid generated when the area bounded by the curve $y \quad x^2 \quad 1$ and x-axis is rotated about x-axis.

15. *(a)* Find the RMS value of $\sqrt{\log x}$ between $x \quad 1$ to $x \quad e$.

(b) Find the approximate value of $\int_{0}^{1} \frac{1}{1 \quad x^2}\, dx$ from using trapezoidal rule by dividing $[0, 1]$ into five equal parts.

16. *(a)* Solve :

$$e^y dx \quad (xe^y \quad 2y)dy \quad 0$$

(b) Solve :

$$(1 \quad x^2)\frac{dy}{dx} \quad y \quad e^{\tan \ 1} x$$

17. *(a)* Solve :

$$\frac{dy}{dx} \quad (9x \quad y \quad 1)^2$$

(b) Solve :

$$\frac{dy}{dx} \quad xy \quad xy^3$$

18. The following table shows the marks obtained by 8 students in Mathematics and Physics. Find the rank correlation coefficient :

Marks in Mathematics	70	48	58	55	54	50	60	52
Marks in Physics	62	47	53	60	55	68	51	48

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