* 4201 *

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)

OCT/NOV—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.
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Evaluate :

$$(x^5 \quad 5^x \quad 5x)\,dx$$

2. Evaluate :

$$\frac{\cos(\log x)}{x}\,dx$$

3. Evaluate :

$$\frac{1}{\sqrt{16 \quad x^2}}\,dx$$

4. Evaluate :

$$\int_1^{\sqrt{3}} \frac{1}{1 \quad x^2}\,dx$$

5. Find the area bounded by the curve $2y \quad x^2$, x-axis between $x \quad 1$ and $x \quad 3$.

6. Find the differential equation for $y \quad Ae^x \quad Be^{\ x}$, where A and B are constants.

7. Solve :

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

8. Solve :

$$\frac{dy}{dx} \quad \frac{y}{x} \quad 8$$

9. Find the arithmetic mean of 14, 16, 19, 25, 21.

10. Write the formula to find the standard deviation for the following :

(a) Simple series (i.e., ungrouped distribution)

(b) Grouped frequency distribution

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 :

$$\sin 4x \cos 2x \, dx$$

(b) Evaluate :

$$\sin^3 x \cos^6 x \, dx$$

12. *(a)* Evaluate :

$$\frac{1}{x^2 \quad 6x \quad 13} \, dx$$

(b) Evaluate :

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

13. *(a)* Evaluate :

$$x^2 e^{2x}\, dx$$

(b) Prove that

$$\int_0^{/2} \frac{\sin^{20} x}{\sin^{20} x \quad \cos^{20} x}\, dx \quad \frac{}{4}$$

14. *(a)* Find the area bounded by the circle $x^2 \quad y^2 \quad a^2$ using integration.

(b) Find the volume of solid of revolution generated by revolving the area enclosed between the curve $y \quad x^2 \quad 3$ and x-axis between the limits $x \quad 1$ and $x \quad 2$.

15. *(a)* Find the RMS value of $\sqrt{8 \quad 4x^2}$ between $x \quad 0$ and $x \quad 2$.

(b) Evaluate

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

using trapezoidal rule by taking $n \quad 4$.

16. *(a)* Solve :

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

(b) Solve :

$$(6x \quad y \quad 1)\, dx \quad (10y \quad x \quad 1)\, dy \quad 0$$

17. *(a)* Solve :

$$\frac{dy}{dx} \quad y \cot x \quad \operatorname{cosec} x$$

(b) Solve :

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

18. Ten students got the following percentage of marks in Mathematics and Physics :

Students (Roll No.)	1	2	3	4	5	6	7	8	9	10
Marks in Mathematics	78	36	98	25	75	82	90	62	65	39
Marks in Physics	84	51	91	60	68	62	86	58	53	47

Calculate the rank correlation coefficient.

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