* 4201 *

C14–A–301/C14–AA–301/C14–AEI–301/
C14–CH–301/C14–CHST–301/C14–CHPC–301/
C14–CHPP–301/C14–CHOT–301/C14–PET–301/
C14–PCT–301/C14–C–301/C14–CM–301/C14–EC–301/
C14–EE–301/C14–IT–301/C14–M–301/C14–RAC–301/
C14–MET–301/C14–MNG–301//C14–TT–301/
C14–BM–301

4201

BOARD DIPLOMA EXAMINATION, (C–14)

OCT/NOV—2017

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 :

$$(\sqrt[3]{x} \quad e^{x} \quad \sin x)\, dx$$

2. Evaluate :

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

3. Evaluate :

$$\sec^{2}(2x \quad 3)\, dx$$

4. Evaluate :

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

5. Evaluate :

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

6. Find the differential equation by eliminating a and b form $y = a \tan^{-1} x + b$.

7. Solve :

$$\frac{dy}{dx} = \sqrt{\frac{1 - y^2}{1 - x^2}}$$

8. Solve :

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

9. Find the Arithmetic mean from the following distribution :

Wt. in kgs	50	55	60	65	70
No. of men	15	20	25	30	10

10. Find the median of the following distribution :

Income (in ₹)	120	160	90	220	260	190
No. of persons	24	26	16	20	6	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 :

$$\int \sin 6x \cos 2x\, dx$$

(b) Evaluate :

$$\int \frac{\tan x - 1}{\tan x + 1}\, dx$$

12. *(a)* Evaluate :

$$\int \sin^4 \cos^3 d$$

(b) Evaluate :

$$x \log x \, dx$$

13. (a) Evaluate :

$$x^4 e^{2x} \, dx$$

(b) Evaluate :

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

14. (a) Find the enclosed by the ellipse

$$\frac{x^2}{a^2} \quad \frac{y^2}{b^2} \quad 1$$

by the method of integration.

(b) Find the volume of a solid generated revolving the area enclosed between $x^2 \quad y^2 \quad 3$, $x \quad 1$, $x \quad 2$, about x-axis.

15. (a) Find the RMS value of $\sqrt{\log x}$ over the range $x \quad 1$, $x \quad e$.

(b) Find $\int_1^2 \frac{1}{x} \, dx$ approximately by dividing the interval [1, 2] into 5 equal parts using trapezoidal rule.

16. (a) Find the differential equation of the family of curves $y \quad A\cos 3x \quad B\sin 3x$.

(b) Solve :

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

17. (a) Solve :

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

(b) Solve :

$$(3x^2 \quad 4y)\,dx \quad (4x \quad 3y^2)\,dy \quad 0$$

18. From the marks obtained by 8 students in Mathematics and Statistics, compute the rank correlation coefficient :

Student number	1	2	3	4	5	6	7	8
Marks in Mathematics	70	48	58	55	54	50	60	52
Marks in Statistics	62	47	53	60	55	68	51	48

★ ★ ★