



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/
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C14-BM-301

4201

BOARD DIPLOMA EXAMINATION, (C-14)

MARCH/APRIL—2018

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 :

$$(x^5 + 5^x + 5x) dx$$

2. Evaluate :

$$\sqrt{1 + \sin 2x} dx$$

3. Evaluate :

$$\frac{1}{36 + x^2} dx$$

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4. Evaluate : *

$$\int_0^{\pi/4} \tan^2 x \, dx$$

5. Evaluate :

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

6. Form the differential equation by eliminating the arbitrary constants A, B from the equation $y = Ae^x + Be^{-x}$.

7. Solve :

$$(1 - e^x) \frac{dy}{dx} = e^x - y$$

8. Solve :

$$y \, dx - x \, dy = 0$$

9. Find the mean of first ten natural numbers.

10. Find the median of the following items :

12, 15, 40, 23, 20, 17, 69, 75

PART—B

10×5=50

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

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

*
11. (a) Evaluate :

$$\int e^x [\cot x - \log(\sin x)] \, dx$$

(b) Evaluate :

$$\int \sqrt{26 - 2x - x^2} \, dx$$

12. (a) Evaluate :

$$\int \frac{1}{2 \cos x} \, dx$$

(b) Evaluate ^{*} :

$$\int \frac{x^7}{(x-3)(x-2)} dx$$

13. (a) Evaluate :

$$\int x \tan^{-1} x dx$$

(b) Show that

$$\int_0^{\pi/2} \frac{\sin x}{\sin x \cos x} dx = \frac{\pi}{4}$$

14. (a) Evaluate :

$$\int_0^1 \frac{x^3}{1-x^8} dx$$

(b) Find the area enclosed by the ellipse $4x^2 + 9y^2 = 36$.

15. (a) Find the RMS value of xe^x between $x = 0$ and $x = 1$.

(b) Find the volume of a sphere of radius r using integration.

16. (a) Solve :

$$\frac{dy}{dx} = e^{3x-2y} - x^2 e^{-2y}$$

(b) Solve :

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

17. Solve :

$$(x^3 + 3xy^2)dy = (y^3 + 3x^2y)dx$$

^{*} 18. (a) Compute the standard deviation of the following data :

Item (x)	2	5	6	8	10	12
Frequency (f)	2	8	10	7	8	5

(b) Calculate the coefficient of correlation between X and Y for the following data :

X	1	2	3	4	5
Y	3	2	5	4	6
