



C14-A-AA-AEI-CH-CHST-CHPC-  
CHPP-CHOT-PET-PCT-C-CM-EC  
-EE-IT-M-RAC-301

4201

BOARD DIPLOMA EXAMINATION, (C-14)  
MARCH/APRIL—2021  
THIRD SEMESTER (COMMON) EXAMINATION  
ENGINEERING MATHEMATICS - II

Time : 3 hours ]

[ Total Marks : 80

**PART—A**

4×5=20

- Instructions :** (1) Answer *any five* questions.  
(2) Each question carries **four** marks.  
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Evaluate  $\int \left( \sqrt{x} + \frac{1}{\sqrt{x}} \right) dx$ .

2. Evaluate  $\int \frac{\cos^2 x}{1 - \sin x} dx$ .

3. Evaluate  $\int \frac{dx}{9 - x^2}$ .

4. Evaluate  $\int_{-2}^2 (x^2 - 7x + 3) dx$ .

5. Find the mean value of  $y^2 = 4x$ , from  $x = 0$  to  $x = 5$ .

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6. Find the differential equation by eliminating the arbitrary constant 'c' from  $\sin^{-1} x + \sin^{-1} y = c$ .
7. Solve  $\frac{dy}{dx} = e^{3x+2y} + x^2 e^{2y}$ .
8. Solve  $\frac{dy}{dx} + \frac{2y}{x} = \frac{1}{x^3}$ .
9. Find the Median and Mode of the numbers 4, 10, 7, 15, 7, 3, 5, 3, 7.
10. Find the standard deviation of 5, 10, 30, 40, 65.

### PART—B

15×4=60

- Instructions :** (1) Answer *any four* questions.  
(2) Each question carries **fifteen** marks.  
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. Evaluate  $\int \frac{dx}{(1+x^2)(\tan^{-1} x)^3}$ .

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12. Evaluate  $\int \sin^3 x \cos^7 x dx$ .

13. Evaluate  $\int \frac{x}{x^2 - 3x + 2} dx$ .

14. Evaluate  $\int_{-1}^1 \log\left(\frac{7-x}{7+x}\right) dx$ .

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15. Find the area enclosed by the curve  $\frac{x^2}{16} + \frac{y^2}{25} = 1$ , by the method of integration.
16. Solve  $(y^2 - 2xy)dx + (2xy + x^2)dy = 0$ .
17. Solve  $\frac{dy}{dx} - y \cot x = \sin x$ .
18. Find the Spearman's Rank Correlation coefficient of ten participants in a contest are ranked by two judges as follows :

A	1	6	5	10	3	2	4	9	7	8
B	6	4	9	8	1	2	3	10	5	7

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