



C14-A/AA/AEI/CH/CHST/IT/MET/MNG/
PKG/TT/C/CM/EC/EE/M-301

4201

BOARD DIPLOMA EXAMINATION, (C-14)
MARCH / APRIL - 2019
COMMON - III SEMESTER 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) Answer should be brief and straight to the point and shall not exceed five simple sentences.

1 Evaluate $\int \frac{x^2 + 2x + 3}{x^4} dx$.

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

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

4 Evaluate $\int_0^1 (x^3 + 1) dx$.

- 5 Find the area bounded by the curve $y = x^2 - x + 1$, the x-axis and the ordinates at $x=1$ and $x=3$.

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[Contd...

- 6 Form the differential equation by eliminating the arbitrary constants A and B from the equation $y = A \cos 3x + B \sin 3x$.
- 7 Solve $\frac{dy}{dx} = e^{x+2y}$.
- 8 Find the integrating factor (I.F) of $\frac{dy}{dx} + \frac{y}{x} = x$.
- 9 Find the arithmetic mean of the numbers 18,36,9,81,63,27,45,72,54.
- 10 Find the Quartile deviation of the monthly income (in Rs.) of 7 men given below.
350,840,650,710,980,575,290.

PART - B

10×5=50

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

11 (a) Evaluate $\int \sin^3 x \cos^4 x \, dx$.

(b) Evaluate $\int \frac{1}{x^2 + 4x + 13} \, dx$.

12 (a) Evaluate $\int \frac{1}{4 + 5 \cos x} \, dx$.

(b) Evaluate $\int \frac{x+2}{(x+1)(x+3)} \, dx$.

- 13** (a) Evaluate $\int x \tan^{-1} x \, dx$.
- (b) Evaluate $\int_0^{\frac{\pi}{2}} \frac{\sqrt{\cot x}}{\sqrt{\cot x} + \sqrt{\tan x}} \, dx$.
- 14** (a) Find the area included between the parabola $y^2 = 4ax$ and its latus rectum.
- (b) Find the volume of the solid generated by revolving the ellipse $9x^2 + 25y^2 = 225$ about x-axis (or major axis).
- 15** (a) Find the R.M.S. value of $y = \sqrt{\log x}$ over the range $x=1$ and $x=e$.
- (b) Calculate the approximate value of $\int_{-3}^3 x^4 \, dx$ using Simpson's rule by dividing $[-3, 3]$ into 6 equal parts.
- 16** Solve $(y^2 - xy)dx = x^2 dy$.
- 17** (a) Solve $(x^3 + 3xy^2)dx + (3x^2y + y^3)dy = 0$.
- (b) Solve $\frac{dy}{dx} + y \cot x = \operatorname{cosec} x$.
- 18** Ten students got the following marks in Mathematics and Physics.

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

Calculate the rank correlation coefficient.