



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—2015

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 $\int (x^4 + 3^x + 2x) dx$.

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

3. Evaluate $\int \frac{\sin(\log x)}{x} dx$.

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

5. Evaluate $\int_0^a \sqrt{a^2 - x^2} \cdot dx$.

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6. Form the differential equation for $y = Ae^{3x} + Be^{-3x}$ where A, B are arbitrary constants.

7. Solve $y^2 dx + x^2 dy = 0$.

8. Solve $\frac{dy}{dx} + \frac{2y}{x} = \frac{1}{x^2}$.

9. Find the arithmetic mean of the following data :

Size of item ξ	:	4	6	8	10	12	14	16
Frequency ϕ	:	2	4	5	3	2	1	4

10. Write the formulae for quartile deviation and coefficient of quartile deviation.

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

(b) Evaluate $\int x^3 e^{-2x} dx$.

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12. (a) Evaluate $\int \frac{\cos x}{\sqrt{1+\cos^2 x}}$.

(b) Evaluate $\int \sin^9 \theta \cos^3 \theta d\theta$.

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13. (a) Evaluate $\int \frac{1}{3 \cos x + 4 \sin x + 6} dx$.

(b) Evaluate $\int_1^5 \frac{dx}{1+x}$ using trapezoidal rule by taking $n = 4$.

14. (a) Find the volume of the solid generated by revolving the area bounded by the ellipse $25x^2 + 16y^2 = 400$ about its major axis.

(b) Find the RMS value of $x^2 e^{2x}$ over the interval $0 \leq x \leq 1$.

15. (a) Evaluate $\int_0^{\pi/2} \log(\tan x) dx$.

(b) Find the area bounded by the curve $y^2 = 4ax$ and its latus rectum.

16. Solve $\frac{dy}{dx} = \frac{xy}{x^2 + y^2}$.

17. (a) Solve $\frac{dy}{dx} + y \cot x = \operatorname{cosec} x$.

(b) Solve $(x + y - 2)dx + (x - y + 4)dy = 0$.

18. Calculate the rank correlation coefficient from the following data showing ranks of ten students in two subjects :

Mathematics	:	3	8	9	2	7	10	4	6	1	5
Physics	:	5	9	10	1	8	7	3	4	2	6

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