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IT-M-MET-MNG-TT-BM-CHOT-CHPC-
CHPP-IT-PET-RAC-302

3202

BOARD DIPLOMA EXAMINATION, (C-09)

MARCH/APRIL—2021

THIRD SEMESTER 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 $\int (x^5 + 5^x + 5x) dx$.

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

3. Evaluate $\int e^{5-3x} dx$.

4. Evaluate $\int \frac{1}{x^2 + 25} dx$.

5. Evaluate $\int (\sin 4x \cdot \cos 2x) dx$.

6. Find $\int_0^{\frac{\pi}{2}} \frac{1}{1 + \cot x} dx$.

7. Find $\int_{-1}^1 x^3 dx$.

8. Form the differential equation for $y = A \cos 3x + B \sin 3x$, where A and B are constants.

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9. Solve $\frac{dx}{dy} = xy + x + y + 1$.
10. Solve $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 4y = 0$.

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 $\int \frac{x}{(x-1)(x-3)} dx$.
12. Evaluate $\int x^2 e^{-5x} dx$.
13. Find $\int_0^{\frac{\pi}{2}} \frac{\sin^5 x}{\sin^5 x + \cos^5 x} dx$.
14. Find the r.m.s. value of $y = xe^x$ as x varies from $x=1$ to $x=4$.
15. Find $\int_2^{10} \frac{1}{1+x} dx$ by Simpson's $\frac{1}{3}$ rule using eight equal intervals.
16. Solve $\frac{dy}{dx} + y \tan x = \sec x$.
17. Solve $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = 3e^x$.
18. Solve $(D^2 - 8D + 9)y = x$.

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