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C20-EE-CHPP-PET–301

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BOARD DIPLOMA EXAMINATION, (C-20)

OCTOBER/NOVEMBER—2023

DEEE - THIRD 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.

1. Evaluate $\int \sqrt{1+\sin 2x}.dx$

2. Evaluate $\int \frac{dx}{x(\log x)^2}$

3. Evaluate $\int \frac{e^{\cos^{-1}x}}{\sqrt{1-x^2}}\,dx$

4. Evaluate $\int x.\cos x.dx$

5. Evaluate $\int_1^{\sqrt{3}} \frac{1}{1+x^2}\,dx$

6. Evaluate $\int_0^{\frac{\pi}{4}} \sec^2 x.dx$

7. Find the mean value of the function $f(x) = x + x^2$ in the interval [2,6].

8. Find the differential equation corresponding to $y = Ae^{4x} + Be^{-4x}$ where A, B are arbitrary constants.

9. Solve $\sqrt{1-x^2}\,dy + \sqrt{1-y^2}\,dx = 0$

10. Find the integrating factor of $\frac{dy}{dx} + y\cot x = \operatorname{cosec} x$

PART—B

8×5=40

Instructions : (1) Answer **all** questions.

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

11. *(a)* Evaluate $\int \cos 7x . \cos 2x . dx$

(OR)

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

12. *(a)* Evaluate $\int \frac{x+7}{(x+2)(x+3)} dx$

(OR)

(b) Evaluate $\int x . \tan^{-1} x . dx$

13. *(a)* Evaluate $\int_0^{\frac{\pi}{4}} \frac{\sec^2 x}{(1+\tan x)^2}\, dx$

(OR)

(b) Evaluate $\int_0^{\frac{\pi}{2}} \frac{\sin^{20} x}{\sin^{20} x + \cos^{20} x}\, dx$

14. *(a)* Find the area enclosed between the Parabolas $y^2 = 4x$ and $x^2 = 4y$.

(OR)

(b) Find the R.M.S values of $\sqrt{\log x}$ between the lines $x = 1$ to $x = e$.

15. *(a)* Find the volume of the right circular cone with base radius r and height h using integration.

(OR)

(b) Obtain the value of $\int_0^6 \frac{dx}{1+x^2}$ using trapezoidal rule by taking $n = 6$.

PART—C

10×1=10

Instructions : (1) Answer the following question.

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

16. Solve $(1+x^2)\frac{dy}{dx} + 2xy = x^3$

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