3202

BOARD DIPLOMA EXAMINATION, (C-09)

JUNE - 2019

DIPLOMA IN AUTOMOBILE ENGINEERING

ENGINEERING MATHEMATICS II

THIRD SEMESTER EXAMINATION

Time: 3 Hours **Total Marks: 80**

PART - A (10 x 3 = 30 Marks)

Note 1:Answer all questions and each question carries 3 marks

2:Answers should be brief and straight to the point and shall not exceed 5 simple sentences

1. Evaluate $\int x^3 \cos\left(x^4\right) dx$
2. Evaluate $\int \frac{dx}{4-8x^2}$
3. Evaluate $\int \frac{1}{\cos^2 x \sin^2 x} dx$
4. Evaluate $\int \frac{\cos x}{a+b\sin x} dx$
5. Evaluate $\int xe^x \, dx$
6. Find the volume of the solid of revolution generated by revolving the area enclosed between the curve $y = x^2 - 9$ and x-axis about x-axis
7. Evaluate $\int_0^{\pi/4} \tan^4 x.\sec^2 x \, dx$
8. Solve $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = 0$
9. Solve $\frac{dy}{dx} = \frac{1+x^2}{1+y^2}$
10. Form the differential equation of family of curves $y = A\cos 5x + B\sin 5x$ Where A,B are arbitrary constants.

PART - B (5 x 10 = 50 Marks)

Note 1:Answer any five questions and each question carries 10 marks

2:The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer

11. i. Evaluate $\int \frac{1}{3x^2+5x-7} dx$ ii. Evaluate $\int x^3 e^x \, dx$
12. i. Evaluate $\int \sin 7x \cos 2x \, dx$ ii. Evaluate $\int \cos^3\theta.\sin^4\theta \, d\theta$
13. a. Evaluate $\int_0^{\pi/2} \frac{(\sin x)^{3/2}}{(\sin x)^{3/2} + (\cos x)^{3/2}} dx$

    b. Find area enclosed between $x^2 = y$ and the line y=3x+4

14. (a). Find the volume of the solid obtained by revolving the region of parabola $x = y^2 + 6y + 8$ cut off by and rotated about y-axis.

    (b). Find the RMS value of log x over x = 1 to x = e.

15. A. Solve $\frac{dy}{dx} + y\cot x = x$ B. Solve $\left(D^2 - 5D + 6\right) y = 3e^{5x}$

16. Solve $\left(x^2 + y^2\right) dx = 2xydy$

17. (a). $Solve\left(D^2 - D - 2\right) y = Sin2x.$

    (b). $Solve\left(D^2 + 1\right) y = x$

18A. Evaluate $\int_0^{10} \frac{dx}{1+x^2}$ by dividing the range into 8 intervals using Trapezoidal rule.

B. Solve $\left(x+y\right)^2 \frac{dy}{dx} = a^2$

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