C09-A-302 / C09-AA-302 / C09-AEI- 302 / C09-C-302 /
C09-CM-302 / C09-EC-302 / C09-EE-302 /
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3202

BOARD DIPLOMA EXAMINATION, (C-09)

OCT / NOV-2015

THIRD SEMESTER (COMMON) EXAMINATION

ENGINEERING MATHEMATICS – II

Time : 3 hours]   [*Total Marks* : 80

PART – A   3 X 10 = 30

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

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

1.   Evaluate $\int (7x - 6)^5 \, dx$.

2.   Evaluate $\int \dfrac{dx}{x^2 - 25}$.

3.   Evaluate $\int (2x - 1)(3x + 4) \, dx$.

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

5.   Evaluate $\int \dfrac{\sec^2 x}{1 + \tan x}$.

6.   Evaluate $\int_{-1}^{1} e^{2x+3} \, dx$.

7.   Evaluate $\int \dfrac{e^{m \sin^{-1} x}}{\sqrt{1 - x^2}} \, dx$.

8.   Solve $\dfrac{dy}{dx} = e^{x+y} + x^2 e^y$.

9. Slove $\dfrac{d^2y}{dx^2} - 2\dfrac{dy}{dx} + 4y = 0$.

10. Form the differential equation of family of curves $y = A \cos x + B \sin x$ where A and B are arbitrary constants.

PART – B
10 X 5 = 50

Instructions : (1) Answers any **five** questions
                (2) Each question carries **ten** marks.
                (3) Answers should be comprehensive and the criteria for valuation is the content but not the length of the answer.

11. (a) Evaluate $\int \dfrac{x^3}{x^2 + x - 20}\, dx$.   (b) Evaluate $\int x \log x\, dx$.

12. (a) Evaluate $\int \sin 7x \cos 2x\, dx$.   (b) Evaluate $\int \cos^3 \theta . \sin^4 \theta\, d\theta$.

13. (a) Find the volume of the sphere with radius 'r' using the method of Integration.

     (b) Find the RMS value of $20 Sin 4t$ between $t = 0$ to $t = \pi/2$.

14. (a) Evaluate $\displaystyle\int_0^{\pi/2} \dfrac{Sin^n x}{Sin^n x + Cos^n x}\, dx$.

     (b) Find the area enclosed by the $3x^2 = 4y$ parabola and the line $2y = 2x + 12$.

15. (a) Solve $(D^2 - 4D + 4)\, y = Cos\, 2x$.

     (b) Solve $(D^2 - 5D + 6)\, y = x$.

16. Solve $(x^3 + 3xy^2)\, dx + (3x^3y + y^3)\, dy = 0$.

17. (a) Solve $\dfrac{dy}{dx} + y \cos x = \sin x . \cos x$.   (b) Solve $(D^2 - 1)\, y = \cosh 2x$

18. (a) Evaluate $\displaystyle\int_0^1 x^2\, dx$ approximately by dividing the interval $[0, 1]$ into 10 subintervals using Simpson's rule.

     (b) Solve $\dfrac{dy}{dx} \sin(x + y)$.

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