C09-A-302 / C09-AA-302 / C09-AEI- 302 / C09-C-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 $\int \frac{dx}{x^2-25}$.

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

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

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

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

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

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

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

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

$10 \times 5 = 50$

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 $\int \frac{x^3}{x^2 + x - 20} dx$. (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 $20Sin4t$ between $t = 0$ to $t = \pi/2$.

14. (a) Evaluate $\int_0^{\pi/2} \frac{Sin^n x}{Sin^n x + Cos^n x} dx$.
(b) Find the area enclosed by the $3x^2 = 4y$ parabola and the line $2y = 2x + 12$.

15. (a) Solve $(D^2 - 4D + 4)\, y = Cos2x$.
(b) Solve $(D^2 - 5D + 6)\, y = x$.

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

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

18. (a) Evaluate $\int_0^1 x^2 dx$ approximately by dividing the interval [0, 1] into 10 subintervals using Simpson's rule.
(b) Solve $\frac{dy}{dx} \sin(x + y)$.

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