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C09–CM–302/C09–EC–302/C09–EE–302/C09–CH–302/
C09–CHPP–302/C09–CHPC–302/C09–CHOT–302/
C09–CHST–302/C09–IT–302/C09–M–302/C09–MET–302/
C09–MNG–302/C09–PET–302/C09–TT–302/C09–RAC–302

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BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—2016

THIRD SEMESTER (COMMON) 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 $x \cos x \, dx$.

2. Evaluate $x \cos x^2 dx$.

3. Evaluate $\frac{e^{m \tan^{-1} x}}{1 + x^2} dx$.

4. Evaluate $\frac{1}{1 - \cos x} dx$.

5. Evaluate $\int \frac{dx}{\sqrt{x^2 \quad 9}}$.

6. Find the mean value of the function between $f(x) \quad x^2 \quad 4x \quad 3$ values of x, where the expression vanishes.

7. Evaluate $\int xe^x dx$.

8. Solve $\frac{d^2y}{dx^2} \quad \frac{dy}{dx} \quad 12y \quad 0$.

9. Find the differential equation whose solution is $y \quad Ae^x \quad Be^{2x}$, where A, B are arbitrary constants.

10. Solve $\frac{dy}{dx} \quad e^{\ y} \quad e^{\ y}x^2$.

PART—B 10×5=50

Instructions : (1) Answer *any* **five** questions.

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

11. *(a)* Evaluate $\int \frac{2x \quad 3}{3x^2 \quad 14 \quad 5} dx$.

(b) Evaluate $\int x^3 \log x \ dx$.

12. *(a)* Evaluate $\int \cos^3 \ \sin^4 \ d$.

(b) Evaluate $\int \cos 2x \cos x \, dx$.

13. *(a)* Find the volume of the solid formed by revolving the area enclosed by the curve $\sqrt{x} \quad \sqrt{y} \quad 1$, $x \quad 0$, $y \quad 0$ about y-axis.

(b) Find the RMS value of $\sqrt{27 \quad 4x^2}$ between $x \quad 0$, $x \quad 3$.

14. Find the area bounded by the curve $16x^2 \quad 25y^2 \quad 400$ using the method of integration.

15. *(a)* Solve $(D^2 \quad 6D \quad 9)y \quad \cos 3x$.

(b) Solve $(D^2 \quad 5D \quad 6)y \quad x$.

16. *(a)* Solve $\frac{dy}{dx} \quad \frac{2y}{x} \quad 3x$.

(b) Solve $(4D^2 \quad 4D \quad 3)y \quad e^{2x}$.

17. Solve $x^2dy \quad (y^2 \quad xy)dx \quad 0$.

18. *(a)* A river is 80 feet wide and depth d (in feet) at a distance x from one bank is given by the following table :

x	0	10	20	30	40	50	60	70	80
d	0	4	7	9	12	15	14	8	3

Find the cross-section of the river using Simpson's rule.

(b) Solve $\frac{dy}{dx} \quad \frac{x \quad y \quad 1}{x \quad y}$.

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