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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—2018

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 $(x^a \quad a^x \quad ax)\,dx$.

2. Evaluate $\dfrac{\sin(\log x)}{x}\,dx$.

3. Evaluate $\dfrac{1}{\sqrt{5 \quad 3x^2}}\,dx$.

4. Evaluate $x\sin(x^2)\,dx$.

5. Evaluate $\int xe^x \, dx$.

6. Find the mean value of $i \quad a \sin t$ over an interval $[0, 2 \ ]$.

7. Evaluate $\int_{\frac{\ }{4}}^{\frac{\ }{4}} \tan x \, dx$.

8. Solve $(D^2 \quad 6D \quad 4)y \quad 0$.

9. Solve $\sqrt{(1 \quad y^2)}\, dx \quad \sqrt{(1 \quad x^2)}\, dy \quad 0$.

10. Find the differential equation whose solution is $Ax^2 \quad By^2 \quad 1$, where A, B are arbitrary constants.

PART—B

10×5=50

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

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

11. *(a)* Evaluate $\int \frac{1}{\sqrt{x^2 \quad x \quad 1}} \, dx$.

(b) Evaluate $\int \log x \, dx$.

12. *(a)* Evaluate $\int \cos 3x . \sin 2x \, dx$.

(b) Evaluate $\int \cos^{10} \quad \sin^3 \quad d \ .$

13. *(a)* Find the volume of the solid obtained by revolving the ellipse $\frac{x^2}{25} \quad \frac{y^2}{9} \quad 1$ about its major axis.

(b) Find the RMS value of $x^2 e^{2x}$ between $0 \quad x \quad 1$.

14. *(a)* Evaluate $\int_0^{\frac{\pi}{2}} \frac{\sin^3 x}{\sin^3 x + \cos^3 x}\, dx$.

(b) Find the area bounded by the parabola $y^2 = x^2 + 6x + 4$ and the straight line $2x + y + 1$.

15. *(a)* Solve $(D^2 + 4)y = \cos^2 x$.

(b) Solve $(D^2 + 4)y = x^4$.

16. Solve $\frac{dy}{dx} + y \tan x = y^2 \sec x$.

17. *(a)* Solve $\frac{dy}{dx} + y \cot x = \operatorname{cosec} x$.

(b) Solve $(D^2 + 4D + 8)y = e^{2x}$.

18. *(a)* Evaluate $\int_2^{10} \frac{dx}{1 + x}$ by dividing the range into 8 intervals using Simpson's rule.

(b) Solve $(12x + 5y + 9)dx + (5x + 2y + 4)dy = 0$.

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