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C09–A–302/C09–AA–302/C09–AEI–302/C09–C–302/ 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 $xe^{x}\,dx$.

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

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

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

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

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

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

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

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

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

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

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

(b) Solve $(D^2 \quad 4)y \quad x^4.$

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

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

(b) Solve $(D^2 \quad 4D \quad 8)\, y \quad e^{2x}.$

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

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

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