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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)

OCT/NOV—2017

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 $\frac{1}{1 \quad \cos x}\,dx$.

2. Evaluate $\frac{dx}{6 \quad 2x^3}$.

3. Evaluate $\frac{\tan^{\ 1} x}{1 \quad x^2}\,dx$.

4. Evaluate $2x.e^{x^2}\,dx$.

5. Evaluate $e^{x}(\sin x \quad \cos x)\,dx$.

6. Find the mean value of the function $y \quad \sin x$ over $(0, \quad)$

7. Evaluate $\int_{0}^{\frac{}{2}} \sqrt{1 \quad \sin 2x}\,.dx$.

8. Find the particular integral of $(D^{2} \quad 16)y \quad \sin 4x$.

9. Form the differential equation of the family of curves $y \quad Ae^{x} \quad Be^{5x}$, where A, B are arbitrary constants.

10. Solve the following :

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

PART—B 10×5=50

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

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

(3) The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer.

11. *(a)* Evaluate $\dfrac{1}{x^{2} \quad 2x \quad 5}\,dx$.

(b) Evaluate $\sin 3x \cos 2x\,dx$.

12. *(a)* Evaluate $\dfrac{\sec^{2} x}{\sqrt{1 \quad \tan^{2} x}}\,dx$.

(b) Evaluate $\dfrac{1}{5 \quad 4\cos x}\,dx$.

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

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

14. *(a)* Evaluate $\int_0^{\frac{2}{}} \frac{\sin^{20} x}{\sin^{20} x \quad \cos^{20} x} dx$.

(b) Find the area bounded by the parabola $y^2 \quad 4x$ and the line $x \quad y \quad 3$.

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

(b) $(D^2 \quad 2D \quad 8)y \quad e^{\ 3x}$

16. Solve $(x^2 \quad y^2)dx \quad 2xydy$.

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

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

18. *(a)* Given $e^0 \quad 1$, $e^1 \quad 2 \ 72$, $e^2 \quad 7 \ 39$, $e^3 \quad 20 \ 09$ and $e^4 \quad 54 \ 60$ verify Simpson's rule by finding the value of $\int_0^4 e^x dx$.

(b) Solve $(x \quad y)^2 \frac{dy}{dx} \quad a^2$.

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