C05–A–301/C05–AA–301/C05–AEI–301/C09–BM–301/
C05–C–301/C05–CCT–301/C05–CH–301/C05–CHOT–301/
C05–CHPC–301/C05–CHPP–301/C05–CHST–301/
C05–CM–301/C05–EC–301/C05–EE–301/C05–IT–301/
C05–M–301/C05–MET–301/C05–MNG–301/

C05–SM–301/C05–TT–301

201

BOARD DIPLOMA EXAMINATION, (C–05)

OCT/NOV—2015

THIRD SEMESTER (COMMON) EXAMINATION

ENGINEERING MATHEMATICS—II

Time : 3 hours]　　　　　　　　　　　　　　[*Total Marks* : 100

PART—A　　　　　　　　4×10=40

Instructions : (1) Answer **all** questions.

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

1. Form the differential equation by eliminating the arbitrary constant
from $\sin^{-1} x + \sin^{-1} y = c$.

2. Solve the differential equation :

$$\frac{dy}{dx} = \frac{1+x^2}{1+y^2}$$

3. Solve the differential equation :

$$\frac{dy}{dx} + y \cot x = \operatorname{cosec} x$$

4. Solve :

$$(x^2 \quad y)dx \quad (y^2 \quad x)dy \quad 0$$

5. Solve :

$$(D^2 \quad 5D \quad 6)y \quad 0$$

6. Find $L\{e^{2t}\cos 4t\}$.

7. Find $L\{3t^2 \quad 5\sin 2t \quad 1\}$.

8. Find

$$L^{\;1}\;\frac{s^2 \quad 4x \quad 5}{s^3}$$

9. Write down the Fourier coefficients for $f(x)$ defined in the interval $0 \quad x \quad 2$.

10. Find the Fourier constant b_n for $f(x) \quad x\sin x$ in $(\quad, \quad)$.

PART—B
12×5=60

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

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

11. *(a)* Evaluate :

$$\int_0^1 \frac{\sin^{\;1}x}{\sqrt{1\quad x^2}}\,dx$$

(b) Find the area bounded by the curve $y \quad x^2 \quad x$, the x-axis and the lines $x \quad 0$, $x \quad 6$.

12. *(a)* Find the volume of the solid formed by revolving the area enclosed by the curve $y \quad \sin x$ about x-axis and the lines $x \quad 0$ to $x \quad$.

(b) Find the RMS value of $y \quad \sqrt{8 \quad 4x^2}$ between $x \quad 0$ and $x \quad 2$.

13. *(a)* Solve :

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

(b) Solve :

$$y(x \quad y)dx \quad x(x \quad y)dy \quad 0$$

14. *(a)* Solve :

$$(D^2 \quad 2D \quad 1)y \quad 4e^{3x}$$

(b) Solve :

$$(D^2 \quad 4)y \quad \sin 3x$$

15. *(a)* Find $L\{t\cos 2t\}$

(b) Find

$$L \quad \frac{\sin t}{t}$$

16. *(a)* Find

$$L^{\ 1} \quad \frac{2s \quad 1}{s^2 \quad 9}$$

(b) Find

$$L^{\ 1} \quad \frac{s \quad 2}{s^2 \quad 5s \quad 6}$$

17. Obtain Fourier series for $f(x) \quad x \quad$ in (,).

18. Find the Fourier series expansion to represent the function $f(x)$ given by

$$F(x) \quad \begin{matrix} 1 & \text{for} & x & 0 \\ 1 & \text{for} & 0 & x \end{matrix}$$

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