H Roll No. .....

TMA–201

B. TECH. (SECOND SEMESTER)
MID SEMESTER
EXAMINATION, 2021-22

ENGINEERING MATHEMATICS—II

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any ***one*** of the sub-questions.

(ii) Each sub-question carries 10 marks.

1. (a) Solve : (CO1)

$$\frac{dy}{dx} = \sin(x+y) + \cos(x+y)$$

OR

(b) Solve : (CO1)

$$\left(1 + ae^{x/y}\right)dx + ae^{x/y}\left(1 - \frac{x}{y}\right)dy = 0$$

2. (a) Solve : (CO1)

$$\left(D^4 - 1\right)y = e^x \cos x$$

P. T. O.

OR

(b) Solve : (CO1)

$$x(x-1)\frac{dy}{dx} - (x-2)y = x^2(2x-1)$$

3. (a) Solve : (CO1)

$$\frac{d^3y}{dx^3} - 3\frac{d^2y}{dx^2} + 4\frac{dy}{dx} - 2y = e^x + \cos x$$

OR

(b) Solve $\frac{d^2y}{dx^2} + y = \sec x$ by using variation of parameters method. (CO1)

4. (a) Find the Laplace transform of $\frac{\cos at - \cos bt}{t}$. (CO1)

OR

(b) Draw the graph of periodic function :

$$f(t) = \begin{cases} t & , \quad 0 < t < \pi \\ \pi - t, & \pi < t < 2\pi \end{cases}$$

and find its Laplace transform. (CO2)

5. (a) Find inverse Laplace transform of $\frac{1}{s^2 - 5s + 6}$. (CO2)

OR

(b) Using Convolution Theorem, find : (CO2)

$$L^{-1}\left\{\frac{s^2}{\left(s^2 + a^2\right)\left(s^2 + b^2\right)}\right\}$$