SLOT A1

SCHOOL OF ADVANCED SCIENCES

RE-CONTINUOUS ASSESSMENT TEST – II

WINTER SEMESTER 2021-2022

Programme Name & Branch: Btech All branch

Course Code: BMAT102L

Course Name: DIFFERENTIAL EQUATIONS AND TRANSFORMS

Faculty Name(s): DEBAROTI DAS

Class Number(s): **Exam Duration: 90 minutes** **Maximum Marks: 50**

General instruction(s): **ANSWER ALL THE QUESTIONS.**

1. Find inverse Laplace transform of $\frac{1}{(s-3)(s+3)^2}$. 10

2. Verify Convolution theorem for $f(t) = sin2t$ and $g(t) = cos3t$. 10

3. Solve $x''(t) - 9x'(t) + 14x(t) = \delta(t-2)$ with $x(0) = 0, x'(0) = 0$ using Laplace transform. 10

4. Solve $xu_x + u_t = xt, x > 0, t > 0$ with $u(x,0) = 0, u(0,t) = 0$ using Laplace transform. 10

5. Find Fourier series expansion for the function 10

$$f(x) = \begin{cases} \pi - x & , -\pi < x < 0 \\ \pi + x & , 0 < x < \pi \end{cases}$$