SRM Institute of Science and Technology
Department of Mathematics
18MAB102T-Advanced Calculus and Complex Analysis
2020-2021 Even
Unit – III: Laplace Transforms
Tutorial Sheet - III

S.No.	Questions	Answers
Part – A [3 Marks]		
1	Using Convolution theorem to evaluate $L^{-1}\left[\dfrac{s}{(s^2+4)^2}\right]$.	$\dfrac{\sin 2t}{4}$
2	Find the inverse Laplace transform of $\dfrac{1}{s^2-5s+6}$ using Partial fraction method.	$e^{3t}-e^{2t}$
3	Find $L^{-1}\left(\dfrac{1}{s(s^2+a^2)}\right)$ using convolution.	$\dfrac{1}{a^2}[1-\cos at]$
4	Find $L^{-1}\left(\dfrac{s^3}{s^4-a^4}\right)$ using Partial fraction method.	$\dfrac{1}{2}[\cos h\,at+\cos at]$
5	Find $L^{-1}\left(\dfrac{2as}{(s^2+a^2)^2}\right)$.	$t\sin at$
Part – B [6 Marks]		
6	Solve the equation by Laplace transform $y''+2y'+5y=e^{-t}\sin t,\ y(0)=0,\ y'(0)=1.$	$\dfrac{e^{-t}}{3}\left(\sin t+\sin 2t\right)$
7	Solve the equation by Laplace transform $y''+9y=6\cos 3t,\ y(0)=2,\ y'(0)=0.$	$2\cos 3t-t\sin 3t$
8	Find $L^{-1}\left(\dfrac{s^2}{(s^2+a^2)(s^2+b^2)}\right)$ using convolution theorem.	$\dfrac{1}{a^2-b^2}[a\sin at-b\sin bt]$
9	Find the inverse Laplace transform of $\dfrac{s+4}{s(s-1)(s^2+4)}$ using Partial fraction method.	$-1+e^t-\dfrac{1}{2}\sin 2t$
10	Solve the equation by Laplace transform $y''-4y'+4y=64\sin 2t,\ y(0)=0,\ y'(0)=1.$	$-8e^{2t}+17t\,e^{2t}+8\cos 2t$