SRM Institute of Science and Technology
Department of Mathematics
18MAB102T-Advanced Calculus and Complex Analysis
2021-2022 Even
Unit – III: Laplace Transforms
Tutorial Sheet - 8

S.No.	Questions	Answers
	Part – A [3 Marks]	
1	Find the inverse Laplace Transform of $\dfrac{1}{(s+3)^2 - 4}$	$\dfrac{1}{2}e^{-3t}\sinh 2t$
2	Find $L^{-1}\left(\dfrac{s^2 + 2s + 6}{s^3}\right)$	$1 + 2t + 3t^2$
3	Find $L^{-1}\left(\dfrac{1}{s(s+a)}\right)$	$\dfrac{1}{a}\left[1 - e^{-at}\right]$
4	Find $L^{-1}\left(\dfrac{1}{(s+2)^5}\right)$	$\dfrac{e^{-2t}t^4}{4!}$
5	If $L[f(t)] = \dfrac{1}{s(s+\beta)}$, then find $\underset{t\to\infty}{lt}\ F(t) =$	$\dfrac{1}{\beta}$
	Part – B[6 Marks]	
6	Find $L^{-1}\left(\dfrac{14s + 10}{49s^2 + 28s + 13}\right)$.	$\dfrac{2}{7}e^{-\frac{2t}{7}}\left(\cos\dfrac{3}{7}t + \sin\dfrac{3}{7}t\right)$
7	Find $L^{-1}\left[\tan^{-1}(1+s)\right]$	$\dfrac{-1}{t}e^{-t}\sin t$
8	Show that $\dfrac{1}{s^{1/2}} = L\left[\dfrac{1}{\sqrt{\pi t}}\right]$	
9	Find $L^{-1}\left(\log\left(\dfrac{s+1}{s-1}\right)\right)$	$\dfrac{1}{t}\left[e^t - e^{-t}\right]$
10	Find $L^{-1}\left[\cot^{-1}\dfrac{3+s}{2}\right]$	$\dfrac{e^{-3t}}{t}\sin 2t$