SRM Institute of Science and Technology
Department of Mathematics
18MAB102T-Advanced Calculus and Complex Analysis
2020-2021 Even
Unit – I: Multiple Integrals
Tutorial Sheet - II

S.No.	Questions	Answers
	Part – A [3 Marks]	
1	Find the area bounded by the lines x=0, y=1 and y=x using double integration	$\frac{1}{2}$ *sq.units*
2	Find the area of a circle of radius 'a' by double Integration in polar coordinates	πa^2 sq. units
3	Evaluate $\int\int dxdy$ over the region bounded by x=0, x=2, y=0 and y=2	4
4	Find the area of the lemniscate $r^2 = a^2 \cos 2\theta$ by double integration	a^2 sq. units
5	Change to polar ordinates : $\int_0^a \int_y^a \frac{x^2 dxdy}{\sqrt{x^2+y^2}}$	$\int_0^{\pi/4} \int_0^{a\sec\theta} r^2 \cos^2\theta drd\theta$
	Part – B [6 Marks]	
6	Find the smaller of the area bounded by $y = 2 - x$ and $x^2 + y^2 = 4$	$\pi - 2$
7	Evaluate $\iint xy(x+y)dxdy$ over the area between $y = x^2$ and $y = x$	$\frac{3}{56}$
8	Find the area lying inside the circle $r = a \sin\theta$ and the outside the cardioid $r = a(1 - \cos\theta)$	$\frac{a^2}{2}\left(2 - \frac{\pi}{2}\right)$
9	Find $\int\int r^3 drd\theta$ over the area A which is the region between the circles $r = 2\sin\theta$ & $r = 4\sin\theta$.	$\frac{45\pi}{2}$
10	Find the area of the cardioid $r = a(1-\cos\theta)$	$\frac{3\pi a^2}{2}$ *sq.units*