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

S.No.	Questions	Answers
	Part – A [3 Marks]	
1	Evaluate $\int_0^3\int_0^2 xy(x+y)dxdy$	30
2	Evaluate $\int_2^4\int_1^2 \frac{dxdy}{xy}$	$(\log 2)^2$
3	Evaluate $\int_0^{\pi/2}\int_0^{2a\cos\theta} rdrd\theta$	$\frac{\pi}{8}$
4	Evaluate $\int_0^{\pi}\int_0^{a(1+\cos\theta)} rdrd\theta$	$\frac{3\pi a^2}{4}$
5	Change the order of integration $\int_0^3\int_1^{\sqrt{4-y}}(x+y)dxdy$	$\int_1^2\int_0^{4-x^2}(x+y)dydx$
	Part – B [6 Marks]	
6	Evaluate $\int_0^1\int_0^{\sqrt{1+x^2}} \frac{dxdy}{1+x^2+y^2}$	$\frac{\pi}{4}\log(1+\sqrt{2})$
7	Evaluate $\int_0^{\pi/2}\int_{a(1-\cos\theta)}^{a} r^2drd\theta$	a^3
8	Change the order of integration $\int_0^a\int_y^a \frac{x}{x^2+y^2}dxdy$ and hence evaluate it	$\frac{\pi}{4}a$
9	Change the order of integration $\int_0^b\int_0^{\frac{a}{b}\sqrt{b^2-y^2}} xydxdy$ and hence evaluate it	$\frac{a^2b^2}{8}$
10	Change the order of integration and hence find the value of $\int_0^1\int_x^1 \frac{x}{x^2+y^2}dxdy$	$\frac{1}{2}\log 2$