SRM Institute of Science and Technology
Department of Mathematics
18MAB102T-Advanced Calculus and Complex Analysis
2021-2022 Even
Module – I: Multiple Integrals
Tutorial Sheet - I

S.No.	Questions	Answers
Part – A [4 Marks]		
1	Evaluate $\int\limits_{0}^{3}\int\limits_{0}^{2} xy(x+y)dxdy$	30
2	Evaluate $\int\limits_{2}^{4}\int\limits_{1}^{2}\dfrac{dxdy}{xy}$	$(\log 2)^2$
3	Evaluate $\int\limits_{0}^{\pi/2}\int\limits_{0}^{2a\cos\theta} rdrd\theta$	$\dfrac{\pi}{8}$
4	Evaluate $\int\limits_{0}^{\pi}\int\limits_{0}^{a(1+\cos\theta)} rdrd\theta$	$\dfrac{3\pi a^2}{4}$
5	Change the order of integration $\int\limits_{0}^{3}\int\limits_{1}^{\sqrt{4-y}}(x+y)dxdy$	$\int\limits_{1}^{2}\int\limits_{0}^{4-x^2}(x+y)dydx$
Part – B [6 Marks]		
6	Evaluate $\int\limits_{0}^{1}\int\limits_{0}^{\sqrt{1+x^2}}\dfrac{dxdy}{1+x^2+y^2}$	$\dfrac{\pi}{4}\log(1+\sqrt{2})$
7	Evaluate $\int\limits_{0}^{\pi/2}\int\limits_{a(1-\cos\theta)}^{a}r^2drd\theta$	a^3
8	Change the order of integration $\int\limits_{0}^{a}\int\limits_{y}^{a}\dfrac{x}{x^2+y^2}dxdy$ and hence evaluate it	$\dfrac{\pi}{4}a$
9	Change the order of integration $\int\limits_{0}^{b}\int\limits_{0}^{\frac{a}{b}\sqrt{b^2-y^2}}xydxdy$ and hence evaluate it	$\dfrac{a^2b^2}{8}$
10	Change the order of integration and hence find the value of $\int\limits_{0}^{1}\int\limits_{x}^{1}\dfrac{x}{x^2+y^2}dxdy$	$\dfrac{1}{2}\log 2$