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

S.No.	Questions	Answers
	Part – A [4 Marks]	
1	Evaluate $\int_0^1 \int_0^{1-x} \int_0^{x+y} e^z \, dxdydz$	$\frac{1}{2}$
2	Evaluate $\int_0^a \int_0^b \int_0^c e^{x+y+z} \, dzdydx$	$\left(e^a-1\right)\left(e^b-1\right)\left(e^c-1\right)$
3	Evaluate $\int_0^2 \int_1^3 \int_1^2 xy^2 z \, dzdydx$	26
4	Evaluate $\int_0^1 \int_0^2 \int_0^3 (x+y+z) \, dxdydz$	18
5	Evaluate $\int_0^1 \int_{y^2}^1 \int_0^{1-x} x \, dxdydz$	$\frac{4}{35}$
	Part – B [6 Marks]	
6	Evaluate $\int_0^1 \int_0^{1-x} \int_0^{(x+y)^2} dzdydx$	$\frac{1}{4}$
7	Evaluate $\int_0^a \int_0^{\sqrt{a^2-x^2}} \int_0^{\sqrt{a^2-x^2-y^2}} \frac{dxdydz}{\sqrt{a^2-x^2-y^2-z^2}}$	$\frac{\pi^2 a^2}{8}$
8	Calculate volume of solid bounded by the surface x = 0, y = 0, x + y + z = 1 and z=0	$\frac{1}{6}$ *cubicunit*
9	Evaluate $\iiint xyz \, dxdydz$ over the positive octant of the sphere $x^2+y^2+z^2=a^2$	$\frac{a^6}{48}$
10	Evaluate $\iiint dxdydz$ where V is the volume of the tetrahedron whose vertices are (0,0,0), (0,1,0), (1,0,0) and (0,0,1)	$\frac{1}{6}$ *cubicunit*