

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

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