	SRM Institute of Science and Technology	
	Kattankulathur	
	DEPARTMENT OF MEATHEMATICS	
	18MAB102T ADVANCED CALCULUS & COMPLEX ANALYSIS	
	UNIT -1 Multiple Integrals	
	Tutorial Sheet -3	

Sl.No.	Questions	Answer
Part - A		
1	Evaluate $\int\limits_{-\pi/2}^{\pi/2}\int\limits_{0}^{2\cos\theta} r^2 dr d\theta$	$\dfrac{32}{9}$
2	Evaluate $\int\limits_{0}^{\pi/2}\int\limits_{0}^{\infty}\dfrac{r dr d\theta}{(r^2+a^2)^2}$	$\dfrac{\pi}{4a^2}$
3	Change into polar co-ordinates $\int\limits_{0}^{\infty}\int\limits_{0}^{\infty} e^{-(x^2+y^2)} dx dy$	$\int\limits_{0}^{\pi/2}\int\limits_{0}^{\infty} e^{-r^2} r dr d\theta$
4	Evaluate $\int\limits_{0}^{2\pi}\int\limits_{0}^{\pi}\int\limits_{0}^{a} r^4 dr\, d\phi\, d\theta$	$\dfrac{2\pi^2 a^5}{5}$
5	Evaluate $\int\limits_{0}^{\log a}\int\limits_{0}^{x}\int\limits_{0}^{x+y} e^{x+y+z} dz\, dy\, dx$	
Part - B		
6	Find $\iiint\limits_{V}\dfrac{dz\, dy\, dx}{\sqrt{1-x^2-y^2-z^2}}$ Where V is the region of space bounded by co-ordinate planes and the sphere $X^2+Y^2+Z^2=1$ and contained in the positive octant	$\dfrac{\pi^2}{8}$
7	Find the Volume of the tetrahedron bounded by the planes x=0, y=0, z=0 , X+Y+Z =5	$\dfrac{125}{6}$
8	Find the volume of the tetrahedron bounded by the plane x/a + y/b + z/c = 1 and all co-ordinate planes	$\dfrac{abc}{6}$
9	Find the volume bounded by the cylinder $x^2 + y^2 = 4$ and the planes y+z=4, z= 0	16π
10	Find the volume of Sphere $x^2 + y^2 + z^2 = a^2$ using triple integration	$\dfrac{4\pi a^3}{3}$

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