SINHGAD COLLEGE OF ENGINEERING, PUNE

ENGINEERING MATHEMATICS-II

UNIT 6- TRIPLE INTEGRTION MCQ

1	Transformation of triple integration to spherical polar coordinates is $a)$ $\iiint_V \; F(r,\theta,\emptyset)r^2 sin\theta d\theta d\emptyset dr$ b) $\iiint_V \; F(r,\theta,z)r^2 sin\theta d\theta d\emptyset dr$ c) $\iiint_V \; F(r,\theta,\emptyset) sin\theta d\theta d\emptyset dr$ d) $\iiint_V \; F(r,\theta,\emptyset)r^2 d\theta d\emptyset dr$	a
2	$\int_{-1}^{1}\int_{0}^{z}\int_{x-z}^{x+z}(x+y+z)dxdydz =$ a)1 b) 0 3) -1 4) none of these	b
3	$\int_{0}^{1}\int_{y^2}^{1}\int_{0}^{1-x} xdxdydz$ a)$\frac{-4}{35}$ b) $\frac{4}{35}$ c) $\frac{2}{35}$ d) $\frac{-2}{35}$	b
4	$\iiint(x^2y^2+y^2z^2+z^2x^2)dxdydz$ throughout the volume of the sphere $x^2+y^2+z^2=a^2$ is a) $\frac{4}{35}a^7$ b) $\frac{-4}{35}a^7\pi$ c) $\frac{4}{35}a^7\pi$ d) $a^7\pi$	c
5	$\iiint_V \sqrt{1-\frac{x^2}{a^2}-\frac{y^2}{b^2}-\frac{z^2}{c^2}}dxdydz$ throughout the volume of the ellipsoid $\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$ is a)$\frac{\pi^2 abc}{4}$ b) $\frac{\pi abc}{4}$ c) $\frac{abc}{4}$ d) $\frac{\pi^2}{4}$	a
6	$\int_{0}^{1}\int_{0}^{1-x}\int_{0}^{x-y} e^z dxdydz =$	c

	a) $\frac{1}{2}$ b) $-\frac{1}{2}$ c) $\frac{1}{4}$ d) $-\frac{1}{4}$	
7	$\int_0^a \int_0^x \int_0^{\sqrt{x+y}} z\,dx\,dy\,dz =$ a) $-\frac{a^2}{4}$ b) $\frac{a}{4}$ c) $\frac{a^3}{4}$ d) $\frac{a^2}{4}$	c
8	$\iiint (x+y+z)\,dxdydz$ over the positive octant of the sphere $x^2+y^2+z^2=a^2$ is a) $\frac{-\pi a^4}{16}$ b) $\frac{3\pi a^4}{16}$ c) $\frac{3\pi a^2}{16}$ d) $\frac{\pi a^4}{6}$	b
9	$\iiint \frac{z^2}{x^2+y^2+z^2}\,dxdydz$ over the volume bounded by $x^2+y^2+z^2=z$ is a) $\frac{\pi a^4}{6}$ b) $\frac{\pi}{3}$ c) $\frac{\pi}{6}$ d) $-\frac{\pi}{6}$	b
10	The Dirichlet's theorem for 3 variables x,y,z is $\iiint x^{a-1}y^{b-1}z^{c-1}\,dxdydz =$ a) $\frac{\Gamma a\ \Gamma b\ \Gamma c}{\Gamma(1+a-b+c)}$ b) $\frac{\Gamma a\ \Gamma b\ \Gamma c}{\Gamma(1-a+b+c)}$ c) $\frac{\Gamma a\ \Gamma b\ \Gamma c}{\Gamma(1+a+b+c)}$ d) $\frac{\Gamma a\ \Gamma b\ \Gamma c}{\Gamma(1+a+b-c)}$	c
11	The mass of the octant of the ellipsoid $\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$ if the density at any point being kxyz is given by $M = ka^2b^2c^2\int_0^{\pi/2}\int_0^{\pi/2}\int_0^1 r^5\sin^3\theta\cos\theta\sin\phi\cos\phi\,d\theta\,d\phi\,dr =$ a) $\frac{ka^2b^2c^2}{45}$ b) $\frac{ka^2b^2c^2}{48}$ c) $\frac{ka^2b^2c^2}{40}$ d) $\frac{ka^2b^2c^2}{42}$	b
12	The volume of the ellipsoid $\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$ is given by $V = 8abc\int_0^{\pi/2}\int_0^{\pi/2}\int_0^1 r^2\sin\theta\,d\theta\,d\phi\,dr =$ a) $\frac{2abc}{3}$ b) $\frac{abc\pi}{3}$ c) $\frac{2abc\pi}{3}$ d) $\frac{4abc\pi}{3}$	d

13	The volume of the tetrahedron bounded by the co-ordinates planes and the plane $\frac{x}{2}+\frac{y}{3}+\frac{z}{4}=1$ is a) 2 b) 3 c) 4 d) 1	C
14	The volume enclosed by the cone $x^2+y^2=z^2$ and the paraboloid $x^2+y^2=z$ given by $V=4\int_0^{\pi/2}\int_0^1(r-r^2)rd\theta dr=$ a) $\frac{\pi}{4}$ b) $\frac{\pi}{6}$ c) $\frac{\pi}{2}$ d) $-\frac{\pi}{4}$	b
15	The volume enclosed by the paraboloid $x^2+y^2=2z$ and the cylinder $x^2+y^2=4$ given by $V=4\int_0^{\pi/2}\int_0^{\rho^2/2}\int_0^2\rho dz d\rho d\phi=$ a) $\frac{\pi}{4}$ b) $\frac{\pi}{6}$ c) 4π d) 2π	c
16	The Volume of the cylinder $x^2+y^2=2ax$ intercepted between paraboloid $x^2+y^2=2az$ and XY- plane is given by, $V=\frac{1}{2a}.2\int_0^{\pi/2}\int_0^{2a\cos\theta}r^2.rd\theta dr=$ a) $\frac{3\pi}{4}$ b) $\frac{3\pi a^3}{4}$ c) $\frac{a^3\pi}{4}$ d) $\frac{3a^3}{4}$	b