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queries MINISTIA BANDHAN Onen for #

S.y. comp. div AEB. TTVS

Vector Integration **Practice Problems**

Sem-III

DIVARR	Sem - III
DIV-A & B Line Integ	Questions
1,48,D1	
1,10,21	Find the work done of the moving partical in the force filed $\overline{F} = 3x^2\hat{\imath} + (2xz - y)\hat{\jmath} - z\hat{k}$ along the line $(0, 0, 0)$ to $(2, 1, 3)$
2,49,D2	2.1 along the line (0, 0,0) to (2,1,3)
,,	Evaluate $\int_{0}^{b} (3r v dr - v^{2} dv)$
	Evaluate $\int_{A}^{B} (3xy dx - y^2 dy)$ along the parabola $y = 2x^2$ from $A(0,0)$ to $B(1,2)$.
	What is the integral if the path is a straight line joining A to B ?
3,50,D3	Find the work done in moving a set it is the control of the set of
	Find the work done in moving a particle in the force field $\overline{F} = 3xyi - 5zj + 10xk$
4,51,D4	along $x = t^2 + 1$, $y = 2t^2$, $z = t^3$ from $t = 1$ to $t = 2$.
,- ,,2 ,	Show that $\overline{F} = (2xyz^2)i + (x^2z^2 + z\cos yz)j + (2x^2yz + y\cos yz)k$ is
	conservative. Find scalar potential ϕ such that $\overline{F} = \nabla \phi$ and hence, find the work done
	by \overline{F} in displacing a particle from (0.0.1) to (1.74.2).
5,52,D5	by \overline{F} in displacing a particle from $(0,0,1)$ to $(1,\pi/4,2)$ along the straight line AB . Prove that $\overline{F} = (2xy+z) i + (x^2+2yz^3) j + (3y^2z^2+x)k$ is irrotational. Find its
	Scalar potential $\frac{d}{d}$ and $\frac{d}{d}$ d
6,53,D6	scalar potential ϕ and evaluate $\int_{(1,2,0)}^{(2,2,1)} \overline{F} \cdot d\overline{r}$ along the straight line.
-,,	If $\overline{F} = (6xy + z^3)i + (3x^2 - z)j + (3xz^2 - y)k$ be the force field, find the work done in moving a particle from (1,24) to (3,3,2).
7,54,D7	Prove that $\overline{F} = 2xye^zi + x^2e^zj + x^2ye^zk$ is irrotational. Find scalar potential ϕ such
	that $\overline{F} = \nabla \phi$ and have $C = 1$.
	that $\overline{F} = \nabla \phi$ and hence, find the work done by \overline{F} in displacing a particle from (2,1,1) to
8,55,D8	Prove that $\overline{F} = 3x^2yi + (x^3 - 2yz^2)j + (3z^2 - 2y^2z)k$ is irrotational. Find scalar potential ϕ such that $\overline{F} = \nabla f$
	potential ϕ such that $\overline{F} = \nabla \phi$ and hence $F = V \phi$ and henc
	potential ϕ such that $\overline{F} = \nabla \phi$ and hence, find the work done by \overline{F} in displacing a particle from $(0,0,0)$ to $(1,1,1)$.
9,56,D9	A vector field is given by $\overline{E} = (-2, 2, -2, -1)$
10,57, D10	scalar potential and also find the line integral from $(1,2)$ to $(2,1)$ Prove that $\overline{F} = (3x^2yz - 3y)i + (x^3z - 3x)j + (x^3y + 2z)k$ is irrotational. Find scalar potential ϕ such that $\overline{F} = \nabla \phi$ and hence find the
10,57, D10	Prove that $F = (3x^2yz - 3y)i + (x^3z - 3x)j + (x^3y + 2z)k$ is irrotational. Find scales
	y and hence, find the work done by E: 1.
11,58, D11	from (0,0,0) to (1,1,1).
, ,	Find scalar potential of $\overline{F} = (6xy^2 - 2z^3)i + (6x^2y + 2yz)j + (y^2 - 6z^2x)k$ if
2,59, D12	the work dolle by I. Ill displacing a newtial of
	f_c . Let using the arc of the curve $r = (\rho t \cos t)i + (ct \sin t)i$
	1-2 1 2 2 2 2
13,60,95	Find the constants a b c such that $\vec{E} = (c_1, c_2, c_3)$
	conservative field. Find its scalar potential and work done in moving a particle from (1,20) to (11,-1).
4,61,96	(1,20) to (11,-1). Prove that $\int_{(1,2)}^{3,4} (6xy^2 - y^3) dx + (6x^2y - 3xy^2dy)$ is independent of the path joining the points (1,2) and (3,4) and hence evaluate it.
	the points $(1,2)(6xy^2 - y^3)dx + (6x^2y - 3xy^2)dy$ is independent of the path joining
5,62,97	the points (1,2) and (3,4) and hence evaluate it.
5,02,97	Find the constant a so that $\overline{F} = (axy - z^3)i + (a - 2)x^2j + (1 - a)xz^2k$ is a conservative field. Find its scalar potential and work $\overline{F} = (axy - z^3)i + (a - 2)x^2j + (a - 2)x^2j + (a - 2)x^2k$
	conservative field. Find its scalar potential and work done in moving a particle from (1,23) to (1,-4,2).
REEN'S The	orem: State GREEN'S Theorem
5,63,98	Forem: State GREEN'S Theorem and hence evaluate the following integrals $\int (2x^2 - y^2) dx + (x^2 + y^2) dy + (x^2 + y^2) dy + (x^2 + y^2) dy$
	c is the boundary of the surface enclosed by the
	lines $x = 0$, $y = 0$, $x = 2$, $y = 2$.
	717-2,

17,64,99	$\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = x^{2}i - xyj \text{ & c' is the triangle having vertices (0,2),(2,0),(4,2).}$
18,65,100	$\int_{C} \left(\frac{1}{y} dx + \frac{1}{x} dy \right)$ where 'c' is the boundary of the region defined by
19,66,101	$x = 1, x = 4, y = 1, & y = \sqrt{x}.$ $\int_C (x^2 - y) dx + (2y^2 + x) dy \text{ around the boundary of the region defined by}$
20.67.102	$y = 4, & y = x^2$.
20,67,102	$\int_{c} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = -xy(x \ i - y \ j) \text{ and c is } r = a \ (1 + \cos\theta)$
21,68,103	The work done by $\overline{F} = (4x - 2y)i + (2x - 4y)j$ in moving a particle once counter clockwise around the circle $(x - 2)^2 + (y - 2)^2 = 4$
22,69,104	$\int_{c} (2x^{2} - y^{2}) dx + (x^{2} + y^{2}) dy$ around the boundary in the xy plane enclosed by the
23,70,105	x-axis and the semi circle $y = \sqrt{1 - x^2}$. $\int_c (3x^2 - 8y^2) dx + (4y - 6xy) dy \text{ where c is the region bounded by } y = \sqrt{x} & y = x$
24,71,106	$\int_{c} (3x^{2} - 8y^{2})dx + (4y - 6xy)dy \text{ where c is the region bounded by } y = \sqrt{x} &$
25,72,107	$y = x^{2}$ $\int_{c} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = (x^{2} - xy)i + (x^{2} - y^{2})j \text{ and c is the region bounded by } x^{2} = 2y \& x = y$
26,73,108	$\int_{C} \left[\left(x^{2} + y^{2} \right) i + \left(x^{2} - y^{2} \right) j \right] \cdot d\overline{r} \text{ where 'c' is the boundary of the region enclosed by circles } x^{2} + y^{2} = 4, x^{2} + y^{2} = 16$
27,74,109	$\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = x^{2} i + x y j \text{ and } C \text{ is the boundary of the rectangle}$ $x = 0, y = 0, x = a, y = b.$
2875,110	$\int_C (x y dx + x y^2 dy)$ where C is the square in the xy-plane with vertices $(1,0), (0,1), (-1,0), and (0,-1)$
STOKE'S T	heorem: State STOKE'S Theorem and hence evaluate the following integrals
29,76,111	$\int_C F \cdot d\overline{r}$ where $\overline{F} = y i + z j + x k$ and C is the boundary of the surface
	$x^2 + y^2 = 1 - z, z > 0$.
30,77,112	$\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = (2x - y)i - yz^{2}j - y^{2}zk \text{ and C is the boundary of the}$
	hemisphere $x^2 + y^2 + z^2 = a^2$ lying above the xy-plane.
31,78,113	$\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = -x y i + 2 y z j + y^{2} k \text{ and C is the boundary of the sphere}$ $x^{2} + y^{2} + z^{2} = a^{2}, z = 0.$
	$x^2 + y^2 + z^2 = a^2, z = 0.$

32,79,1	$\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = (x+y)i + (y+z)j - x \text{ k and s is the surface of the plan}$
	2x + y + z = 2 in the first quadrant.
33,80,11	
	$\overline{F} = (2x - y + z)i + (x + y - z^2)j + (3x - 2y + 4z)k \text{ and s is the surface of the}$
	$\frac{y^2 - (2x - y + 2)t + (x + y - z)}{(x + y - z)} + (3x - 2y + 4z) $ and s is the surface of the
34,81,116	cylinder $x^2 + y^2 = 4$ bounded by the plane $z = 9$ and open at the other end.
	$\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = (x^2 + y^2)i + 4xyj \text{ and } c \text{ is the boundary of the region bounded by}$
35,82,117	the parabola $y^2 = 4x$ and line $x = 4$.
,,	$\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = (x+y)i + (2x-z)j + (y+z)k \text{ and c is the boundary of the triangle}$
36,83,118	cutoff by the plane $x + 2y + 3z = 6$ on the coordinate axes.
20,03,110	$\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = z^{2}i + x^{2}j + y^{2}k \text{ and C is the curved surface of the hemisphere}$
37,84,119	$x^2 + y^2 + z^2 = 100, z \ge 0$
37,04,119	Work done in moving a particle once around the perimeter of the triangle with vertices
	$(2,0,0), (0,3,0)$ and $(0,0,6)$ under the force $\overline{F} = (x+y)i + (2x-z)j + (y+z)k$
38,85,120	(2,0,0), (0,3,0) and (0,0,6) under the force $F = (x+y)i + (2x-z)j + (y+z)k$
38,85,120	$(2,0,0)$, $(0,3,0)$ and $(0,0,6)$ under the force $\overline{F} = (x+y)i + (2x-z)j + (y+z)k$ $\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = zi + xj + yk \text{ and C is the boundary of the hemisphere } z = \sqrt{1-x^2-y^2} \text{ in the xy plane}$
	(2,0,0), (0,3,0) and (0,0,6) under the force $F = (x + y)i + (2x - z)j + (y + z)k$ $\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = zi + xj + yk \text{ and } C \text{ is the boundary of the hemisphere } z = \sqrt{1 - x^2 - y^2} \text{ in the xy plane}$
GAUSS'S	(2,0,0), $(0,3,0)$ and $(0,0,6)$ under the force $F = (x+y)i + (2x-z)j + (y+z)k\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = zi + xj + yk \text{ and } C \text{ is the boundary of the hemisphere } z = \sqrt{1-x^2-y^2} \text{ in the xy plane} DIVERGENCE Theorem: State GAUSS'S DIVERGENCE Theorem and hence evaluate$
GAUSS'S i	(z,0,0), $(0,3,0)$ and $(0,0,6)$ under the force $F = (x+y)i + (2x-z)j + (y+z)k\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = zi + xj + yk \text{ and C is the boundary of the hemisphere } z = \sqrt{1-x^2-y^2} \text{ in the xy plane} DIVERGENCE Theorem: State GAUSS'S DIVERGENCE Theorem and hence evaluate$
GAUSS'S in the following 19,86,121	(2,0,0), (0,3,0) and (0,0,6) under the force $F = (x + y)i + (2x - z)j + (y + z)k$ $\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = zi + xj + yk \text{ and C is the boundary of the hemisphere } z = \sqrt{1 - x^2 - y^2} \text{ in the xy plane}$ DIVERGENCE Theorem: State GAUSS'S DIVERGENCE Theorem and hence evaluate ag $\iint_{S} \overline{N} \cdot \overline{F} ds \text{ where } \overline{F} = 4xi - 2y^2j + z^2k \text{ and S is the region bounded by } x^2 + y^2 = 4, z = 0, z = 3.$
GAUSS'S 1 the followin 39,86,121	(z,0,0), $(0,3,0)$ and $(0,0,6)$ under the force $F=(x+y)i+(2x-z)j+(y+z)k\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = zi + xj + yk \text{ and C is the boundary of the hemisphere } z = \sqrt{1-x^2-y^2} \text{ in the xy plane} DIVERGENCE Theorem: State GAUSS'S DIVERGENCE Theorem and hence evaluate \overline{B} \iint_{S} \overline{N} \cdot \overline{F} ds \text{ where } \overline{F} = 4xi - 2y^2j + z^2k \text{ and S is the region bounded by } x^2 + y^2 = 4, z = 0, z = 3. \iint_{S} \overline{N} \cdot \overline{F} ds \text{ where } \overline{F} = (2x + 3z^2)i - (xz^2 + y)i + (y^2 + 2z)k \text{ and S is the region}$
GAUSS'S 1 the followin 39,86,121	(2,0,0), (0,3,0) and (0,0,6) under the force $F = (x + y)i + (2x - z)j + (y + z)k$ $\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = zi + xj + yk \text{ and C is the boundary of the hemisphere } z = \sqrt{1 - x^2 - y^2} \text{ in the xy plane}$ DIVERGENCE Theorem: State GAUSS'S DIVERGENCE Theorem and hence evaluate and $\overline{F} = 4xi - 2y^2j + z^2k$ and S is the region bounded by $x^2 + y^2 = 4$, $z = 0$, $z = 3$. $\iint_{S} \overline{N} \cdot \overline{F} ds \text{ where } \overline{F} = (2x + 3z^2)i - (xz^2 + y)j + (y^2 + 2z)k \text{ and S is the surface of the sphere with centre } (3,-14,-17) \text{ and radius } 3.$
GAUSS'S 1 the followin 39,86,121 10,87,122	(z,0,0), $(0,3,0)$ and $(0,0,6)$ under the force $F=(x+y)i+(2x-z)j+(y+z)k\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = zi + xj + yk \text{ and C is the boundary of the hemisphere } z = \sqrt{1-x^2-y^2} \text{ in the xy plane} DIVERGENCE Theorem: State GAUSS'S DIVERGENCE Theorem and hence evaluate \overline{B} \overline{B} \overline{B} \overline{B} \overline{B} \overline{B} where \overline{B} \overline{B} \overline{B} \overline{B} \overline{B} where \overline{B} B$
GAUSS'S 1 the followin 39,86,121 10,87,122 1,88,123 2,89,124	(z,0,0), $(0,3,0)$ and $(0,0,6)$ under the force $F = (x+y)i + (2x-z)j + (y+z)k\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = zi + xj + yk \text{ and C is the boundary of the hemisphere } z = \sqrt{1-x^2-y^2} \text{ in the xy plane} DIVERGENCE Theorem: State GAUSS'S DIVERGENCE Theorem and hence evaluate \frac{g}{g} \iint_{S} \overline{N} \cdot \overline{F} ds \text{ where } \overline{F} = 4xi - 2y^2j + z^2k \text{ and S is the region bounded by } x^2 + y^2 = 4, z = 0, z = 3. \iint_{S} \overline{N} \cdot \overline{F} ds \text{ where } \overline{F} = (2x + 3z^2)i - (xz^2 + y)j + (y^2 + 2z)k \text{ and S is the surface of the sphere with centre } (3,-14,-17) \text{ and radius } 3. \iint_{S} \overline{N} \cdot \overline{F} ds \text{ where } \overline{F} = 4xzi - y^2j + yzk \text{ and S is the surface of the cube bounded by the planes } x = 0, x = 1, y = 0, y = 1, z = 0, z = 1.$
GAUSS'S 1 the followin 39,86,121 10,87,122 1,88,123 2,89,124	(2,0,0), $(0,3,0)$ and $(0,0,6)$ under the force $F=(x+y)i+(2x-z)j+(y+z)k\int_{C} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = zi + xj + yk \text{ and C is the boundary of the hemisphere } z = \sqrt{1-x^2-y^2} \text{ in the xy plane} DIVERGENCE Theorem: State GAUSS'S DIVERGENCE Theorem and hence evaluate \int_{S} \overline{N} \cdot \overline{F} ds where \overline{F} = 4xi - 2y^2j + z^2k and S is the region bounded by x^2 + y^2 = 4x^2 + 2x^2 + 3x^2 +$
GAUSS'S 1 the followin 39,86,121 40,87,122 1,88,123 2,89,124 3,90,125	(2,0,0), (0,3,0) and (0,0,6) under the force $F = (x + y)i + (2x - z)j + (y + z)k$ $\int_{C} \overline{F} . d\overline{r} \text{ where } \overline{F} = zi + xj + yk \text{ and } C \text{ is the boundary of the hemisphere } z = \sqrt{1 - x^2 - y^2} \text{ in the xy plane}$ DIVERGENCE Theorem: State GAUSS'S DIVERGENCE Theorem and hence evaluate \overline{B} $\int_{S} \overline{N} . \overline{F} ds \text{ where } \overline{F} = 4xi - 2y^2j + z^2k \text{ and } S \text{ is the region bounded by } x^2 + y^2 = 4, z = 0, z = 3.$ $\int_{S} \overline{N} . \overline{F} ds \text{ where } \overline{F} = (2x + 3z^2)i - (xz^2 + y)j + (y^2 + 2z)k \text{ and } S \text{ is the surface of the sphere with centre } (3,-14,-17) \text{ and radius } 3.$ $\int_{S} \overline{N} . \overline{F} ds \text{ where } \overline{F} = 4xzi - y^2j + yzk \text{ and } S \text{ is the surface of the cube bounded by the planes } x = 0, x = 1, y = 0, y = 1, z = 0, z = 1.$ $\int_{S} \overline{F} . d\overline{S} \text{ where } \overline{F} = xi + yj + zk \text{ and } S \text{ is the triangle } (1,0,0), (0,1,0) \text{ and } (0,0,1).$ $\int_{S} \overline{F} . d\overline{S} \text{ where } \overline{F} = x^3i + y^3j + z^3k \text{ and } S \text{ is the surface of the sphere } x^2 + y^2 + z^2 = 9.$
GAUSS'S 1 the followin 39,86,121 40,87,122 1,88,123 2,89,124 3,90,125	(2,0,0), (0,3,0) and (0,0,6) under the force $F = (x + y)i + (2x - z)j + (y + z)k$ $\int_{C} \overline{F} . d \overline{r} \text{ where } \overline{F} = zi + xj + yk \text{ and C is the boundary of the hemisphere } z = \sqrt{1 - x^2 - y^2} \text{ in the xy plane}$ DIVERGENCE Theorem: State GAUSS'S DIVERGENCE Theorem and hence evaluate $\frac{1}{2} \int_{S} \overline{N} . \overline{F} ds$ where $\overline{F} = 4xi - 2y^2j + z^2k$ and S is the region bounded by $x^2 + y^2 = 4$, $z = 0$, $z = 3$. $\iint_{S} \overline{N} . \overline{F} ds \text{ where } \overline{F} = (2x + 3z^2)i - (xz^2 + y)j + (y^2 + 2z)k \text{ and S is the surface of the sphere with centre (3,-14,-17) and radius 3.}$ $\iint_{S} \overline{N} . \overline{F} ds \text{ where } \overline{F} = 4xzi - y^2j + yzk \text{ and S is the surface of the cube bounded by the planes } x = 0$, $x = 1$, $y = 0$, $y = 1$, $z = 0$, $z = 1$. $\iint_{S} \overline{F} . d\overline{S} \text{ where } \overline{F} = xi + yj + zk \text{ and S is the triangle (1,0,0), (0,1,0) and (0,0,1).}$ $\iint_{S} \overline{F} . d\overline{S} \text{ where } \overline{F} = x^3i + y^3j + z^3k \text{ and S is the surface of the sphere } x^2 + y^2 + z^2 = 1$ $\iint_{S} \overline{F} . d\overline{S} \text{ where } \overline{F} = xi + yj + zk \text{ and S is the surface of the sphere } x^2 + y^2 + z^2 = 1$ $\iint_{S} \overline{F} . d\overline{S} \text{ where } \overline{F} = xi + yj + zk \text{ and S is the surface of the sphere } x^2 + y^2 + z^2 = 1$
GAUSS'S 1 the followin 39,86,121 10,87,122 1,88,123 2,89,124 3,90,125 ,91,126	$\int_{C}^{\infty} \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = zi + xj + yk \text{ and C is the boundary of the hemisphere } z = \sqrt{1 - x^2 - y^2} \text{ in the xy plane}$ $\text{DIVERGENCE Theorem: State GAUSS'S DIVERGENCE Theorem and hence evaluate}$ $\int_{S}^{\infty} \overline{N} \cdot \overline{F} ds \text{ where } \overline{F} = 4xi - 2y^2j + z^2k \text{ and S is the region bounded by } x^2 + y^2 = 4, z = 0, z = 3.$ $\iint_{S}^{\infty} \overline{N} \cdot \overline{F} ds \text{ where } \overline{F} = (2x + 3z^2)i - (xz^2 + y)j + (y^2 + 2z)k \text{ and S is the surface of the sphere with centre } (3,-14,-17) \text{ and radius } 3.$ $\iint_{S}^{\infty} \overline{N} \cdot \overline{F} ds \text{ where } \overline{F} = 4xzi - y^2j + yzk \text{ and S is the surface of the cube bounded by the planes } x = 0, x = 1, y = 0, y = 1, z = 0, z = 1.$ $\iint_{S}^{\infty} \overline{F} \cdot d\overline{s} \text{ where } \overline{F} = xi + yj + zk \text{ and S is the triangle } (1,0,0), (0,1,0) \text{ and } (0,0,1).$ $\iint_{S}^{\infty} \overline{F} \cdot d\overline{s} \text{ where } \overline{F} = xi + yj + zk \text{ and S is the surface of the sphere } x^2 + y^2 + z^2 = 0.$ $\iint_{S}^{\infty} \overline{F} \cdot d\overline{s} \text{ where } \overline{F} = xi + yj + zk \text{ and S is the surface of the sphere } x^2 + y^2 + z^2 = 0.$ $\iint_{S}^{\infty} \overline{F} \cdot d\overline{s} \text{ where } \overline{F} = xi + yj + zk \text{ and S is the cylindrical surface bounded by } x^2 + y^2 + z^2 = 0.$
GAUSS'S 1 the followin 39,86,121 10,87,122 1,88,123 2,89,124 3,90,125 ,91,126	$(2,0,0)$, $(0,3,0)$ and $(0,0,6)$ under the force $F=(x+y)i+(2x-z)j+(y+z)k$ $\int \overline{F} \cdot d\overline{r} \text{ where } \overline{F} = zi + xj + yk \text{ and C is the boundary of the hemisphere } z = \sqrt{1-x^2-y^2} \text{ in the xy plane}$ DIVERGENCE Theorem: State GAUSS'S DIVERGENCE Theorem and hence evaluate $\int_S \overline{N} \cdot \overline{F} ds$ where $\overline{F} = 4xi - 2y^2j + z^2k$ and S is the region bounded by $x^2 + y^2 = 4$, $z = 0$, $z = 3$. $\iint_S \overline{N} \cdot \overline{F} ds$ where $\overline{F} = (2x + 3z^2)i - (xz^2 + y)j + (y^2 + 2z)k$ and S is the surface of the sphere with centre $(3,-14,-17)$ and radius 3. $\iint_S \overline{N} \cdot \overline{F} ds$ where $\overline{F} = 4xzi - y^2j + yzk$ and S is the surface of the cube bounded by the planes $x = 0$, $x = 1$, $y = 0$, $y = 1$, $z = 0$, $z = 1$. $\iint_S \overline{F} \cdot d\overline{S}$ where $\overline{F} = xi + yj + zk$ and S is the triangle $(1,0,0)$, $(0,1,0)$ and $(0,0,1)$. $\iint_S \overline{F} \cdot d\overline{S}$ where $\overline{F} = x^3i + y^3j + z^3k$ and S is the surface of the sphere $x^2 + y^2 + z^2 = 0$. $\iint_S \overline{F} \cdot d\overline{S}$ where $\overline{F} = x^3i + y^3j + z^3k$ and S is the surface of the sphere $x^2 + y^2 + z^2 = 0$. $\iint_S \overline{F} \cdot d\overline{S}$ where $\overline{F} = x^3i + y^3j + z^3k$ and S is the cylindrical surface bounded by $x^2 + y^2 = a^2$, $z = 0$, $z = h$. $\iint_S \overline{N} \cdot \overline{F} ds$ where $\overline{F} = 2x^2yi - y^2j + 4xz^2k$ and S is the region of first octant bounded by $y^2 + z^2 = 9$, $x = 2$.
GAUSS'S 1 the followin 39,86,121 10,87,122 1,88,123 2,89,124 3,90,125 ,91,126	$\int_{C} \overline{F} . d \overline{r} \text{ where } \overline{F} = zi + xj + yk \text{ and C is the boundary of the hemisphere } z = \sqrt{1 - x^2 - y^2} \text{ in the } xy \text{ plane}$ DIVERGENCE Theorem: State GAUSS'S DIVERGENCE Theorem and hence evaluate $\int_{C} \overline{f} . d \overline{r} \text{ where } \overline{F} = 4xi - 2y^2j + z^2k \text{ and S is the region bounded by } x^2 + y^2 = 4, z = 0, z = 3.$ $\iint_{S} \overline{N} . \overline{F} ds \text{ where } \overline{F} = (2x + 3z^2)i - (xz^2 + y)j + (y^2 + 2z)k \text{ and S is the surface of the sphere with centre } (3,-14,-17) \text{ and radius } 3.$ $\iint_{S} \overline{N} . \overline{F} ds \text{ where } \overline{F} = 4xzi - y^2j + yzk \text{ and S is the surface of the cube bounded by the planes } x = 0, x = 1, y = 0, y = 1, z = 0, z = 1.$ $\iint_{S} \overline{F} . d\overline{S} \text{ where } \overline{F} = xi + yj + zk \text{ and S is the triangle } (1,0,0), (0,1,0) \text{ and } (0,0,1).$ $\iint_{S} \overline{F} . d\overline{S} \text{ where } \overline{F} = x^3i + y^3j + z^3k \text{ and S is the surface of the sphere } x^2 + y^2 + z^2 = y.$ $\iint_{S} \overline{F} . d\overline{S} \text{ where } \overline{F} = xi + yj + zk \text{ and S is the surface of the sphere } x^2 + y^2 + z^2 = y.$ $\iint_{S} \overline{F} . d\overline{S} \text{ where } \overline{F} = xi + yj + zk \text{ and S is the cylindrical surface bounded by } x^2 + y^2 + z^2 = y.$ $\iint_{S} \overline{F} . d\overline{S} \text{ where } \overline{F} = xi + yj + zk \text{ and S is the cylindrical surface bounded by } x^2 + y^2 + z^2 = y.$ By expressing $\iint_{S} (y^2z^2i + z^2x^2i + x^2y^2k) d\overline{S} \text{ as a surface of the sphere } x = x^2y^2i + x^2y^2k.$ By expressing $\iint_{S} (y^2z^2i + z^2x^2i + z^2x^2i + x^2y^2k) d\overline{S} \text{ as a surface of the sphere } x = x^2y^2i + x^2y^2k.$
GAUSS'S 1 the followin 39,86,121 40,87,122 1,88,123 2,89,124 3,90,125 ,91,126 ,92,127 93,128	[2,0,0), (0,3,0) and (0,0,6) under the force $F = (x + y)i + (2x - z)j + (y + z)k$ $\int_{C} \overline{F} . d \overline{r} \text{ where } \overline{F} = zi + xj + yk \text{ and C is the boundary of the hemisphere } z = \sqrt{1 - x^2 - y^2} \text{ in the xy plane}$ DIVERGENCE Theorem: State GAUSS'S DIVERGENCE Theorem and hence evaluate $\int_{C} S_i N. \overline{F} ds$ where $\overline{F} = 4xi - 2y^2j + z^2k$ and S is the region bounded by $x^2 + y^2 = 4$, $z = 0$, $z = 3$. $\int_{C} S_i N. \overline{F} ds$ where $\overline{F} = (2x + 3z^2)i - (xz^2 + y)j + (y^2 + 2z)k$ and S is the surface of the sphere with centre (3,-14,-17) and radius 3. $\int_{C} S_i N. \overline{F} ds$ where $\overline{F} = 4xzi - y^2j + yzk$ and S is the surface of the cube bounded by the planes $x = 0$, $x = 1$, $y = 0$, $y = 1$, $z = 0$, $z = 1$. $\int_{C} \overline{F} . d\overline{s}$ where $\overline{F} = xi + yj + zk$ and S is the triangle (1,0,0), (0,1,0) and (0,0,1). $\int_{C} \overline{F} . d\overline{s}$ where $\overline{F} = xi + yj + zk$ and S is the surface of the sphere $x^2 + y^2 + z^2 = 0$. $\int_{C} \overline{F} . d\overline{s}$ where $\overline{F} = xi + yj + zk$ and S is the surface of the sphere $x^2 + y^2 + z^2 = 0$. $\int_{C} \overline{F} . d\overline{s}$ where $\overline{F} = xi + yj + zk$ and S is the cylindrical surface bounded by $x^2 + y^2 = a^2$, $z = 0$, $z = h$ $\int_{C} \overline{F} . d\overline{s}$ where $\overline{F} = 2x^2yi - y^2j + 4xz^2k$ and S is the region of first octant bounded by $y^2 + z^2 = 9$, $x = 2$ By expressing $\int_{C} S_i (y^2z^2i + z^2x^2j + x^2y^2k) . d\overline{s}$ as volume integral and evaluate over the part of $x^2 + y^2 + z^2 = 1$ lying above the xy relates
GAUSS'S 1 the followin 39,86,121 40,87,122 11,88,123 2,89,124 3,90,125 1,91,126 1,92,127 93,128	(2,0,0), (0,3,0) and (0,0,6) under the force $F = (x + y)i + (2x - z)j + (y + z)k$ $\int \overline{F} \cdot d \overline{r} \text{ where } \overline{F} = zi + xj + yk \text{ and C is the boundary of the hemisphere } z = \sqrt{1 - x^2 - y^2} \text{ in the xy plane}$ DIVERGENCE Theorem: State GAUSS'S DIVERGENCE Theorem and hence evaluate $\iint_S \overline{N} \cdot \overline{F} ds \text{ where } \overline{F} = 4xi - 2y^2j + z^2k \text{ and S is the region bounded by } x^2 + y^2 = 4, z = 0, z = 3.$ $\iint_S \overline{N} \cdot \overline{F} ds \text{ where } \overline{F} = (2x + 3z^2)i - (xz^2 + y)j + (y^2 + 2z)k \text{ and S is the surface of the sphere with centre } (3,-14,-17) \text{ and radius } 3.$ $\iint_S \overline{N} \cdot \overline{F} ds \text{ where } \overline{F} = 4xzi - y^2j + yzk \text{ and S is the surface of the cube bounded by the planes } x = 0, x = 1, y = 0, y = 1, z = 0, z = 1.$ $\iint_S \overline{F} \cdot d\overline{S} \text{ where } \overline{F} = xi + yj + zk \text{ and S is the triangle } (1,0,0), (0,1,0) \text{ and } (0,0,1).$ $\iint_S \overline{F} \cdot d\overline{S} \text{ where } \overline{F} = x^3i + y^3j + z^3k \text{ and S is the surface of the sphere } x^2 + y^2 + z^2 = \frac{1}{2}$ $\iint_S \overline{F} \cdot d\overline{S} \text{ where } \overline{F} = xi + yj + zk \text{ and S is the surface of the sphere } x^2 + y^2 + z^2 = \frac{1}{2}$ $\iint_S \overline{F} \cdot d\overline{S} \text{ where } \overline{F} = xi + yj + zk \text{ and S is the cylindrical surface bounded by } x^2 + y^2 = a^2, z = 0, z = h$ $\iint_S \overline{N} \cdot \overline{F} ds \text{ where } \overline{F} = 2x^2yi - y^2j + 4xz^2k \text{ and S is the region of S } \overline{S} \text{ where } \overline{F} = 2x^2yi - y^2j + 4xz^2k \text{ and S is the region of S } \overline{S} \text{ where } \overline{F} = 2x^2yi - y^2j + 4xz^2k \text{ and S is the region of S } \overline{S} \text{ where } \overline{F} = 2x^2yi - y^2j + 4xz^2k \text{ and S is the region of S } \overline{S} \text{ where } \overline{F} = 2x^2yi - y^2j + 4xz^2k \text{ and S is the region of S } \overline{S} \text{ where } \overline{F} = 2x^2yi - y^2j + 4xz^2k \text{ and S is the region of S } \overline{S} \text{ where } \overline{F} = 2x^2yi - y^2j + 4xz^2k \text{ and S is the region of S } \overline{S} \text{ where } \overline{F} \text{ where } \overline{F} = 2x^2yi - y^2j + 4xz^2k \text{ and S is the region of S } \overline{S} \text{ where } \overline{F} \text{ where } \overline{F} \text{ where } \overline{F} \text{ where } \overline{F} \text{ where } \overline{S} \text{ where } \overline{F} \text{ where } \overline{S} \text$