SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES::CHITTOOR

SUBJECT: ALGEBRA & CALCULUS (20BSC111) – QUESTION BANK

YEAR: I B.Tech I Sem ACADEMIC YEAR: 2021-22

Question No.	Questions	BLOOMS TAXONOMY
	UNIT – 1: MATRICES	
	PART-A (Two Marks Questions)	
1.	Define the rank of the matrix	**L1**
2.	Define Echelon form of a matrix with suitable example	**L1**
3.	Define Normal form of a matrix with suitable example	**L1**
4.	Find the rank of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 3 & 6 & 9 \end{bmatrix}$	**L1,L2,L3**
5.	Find the rank of the matrix $\begin{bmatrix} -1 & 0 & 6 \\ 3 & 6 & 1 \\ -5 & 1 & 3 \end{bmatrix}$	**L1,L2,L3**
6.	Find the rank of the matrix $\begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$	**L1,L2,L3**
7.	Write the process in Gauss Elimination method	**L1**
8.	Define Eigen values and Eigen vectors	**L1**
9.	Write the Characteristic Equation of $\begin{bmatrix} 1 & 1 \\ 2 & 5 \end{bmatrix}$	**L1,L2,L3**
10.	Write the Eigen values of $\begin{bmatrix} 8 & -4 \\ 2 & 2 \end{bmatrix}$	**L1,L2,L3**
11.	Write the Characteristic Equation of the matrix A= $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 9 \end{bmatrix}$	**L1,L2,L3**
12.	What are the eigen values of A= $\begin{bmatrix} 1 & -2 & 3 \\ 0 & 4 & 5 \\ 0 & 0 & 9 \end{bmatrix}$	**L1,L2,L3**
13.	Find the eigen values of A^{-1} Where A= $\begin{bmatrix} 1 & 0 & 0 \\ 0 & -2 & 0 \\ 0 & 0 & 7 \end{bmatrix}$	**L1,L2,L3**
14.	If the Eigen values of A are 1,-2,3 then eigen values of A^{-1} are?	**L1,L2,L3**
15.	If the Eigen values of A are 3,4 then Eigen values of A^3 are?	**L1,L2,L3**
16.	State the Cayley Hamilton Theorem	**L1**
17.	If the Characteristic equation of A is $\lambda^3 - \lambda^2 + 3\lambda - 1 = 0$ then A^{-1} is?	**L1,L2,L3**
18.	Find A^{-1}, when the characteristic equation of the matrix A is $\lambda^2 - 5\lambda + 7 = 0$	**L1,L2,L3**
19.	Define Diagonalizable matrix	**L1**
20.	Define Modal matrix	**L1**

Question No.	Questions	BLOOMS TAXONOMY
	UNIT – 1 MATRICES	
	PART-B (Ten Marks Questions)	
1.	Find the rank of the following matrix, by reducing into the echelon form $\begin{bmatrix} -1 & -3 & 3 & -1 \\ 1 & 1 & -1 & 0 \\ 2 & -5 & 2 & -3 \\ -1 & 1 & 0 & 1 \end{bmatrix}$	**L1,L2,L3**
2.	Find the rank of the following matrix, by reducing into the echelon form $\begin{bmatrix} 2 & 1 & 3 & 5 \\ 4 & 2 & 1 & 3 \\ 8 & 4 & 7 & 13 \\ 8 & 4 & -3 & -1 \end{bmatrix}$	**L1,L2,L3**
3.	Reduce the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 3 & 4 & 5 \\ 2 & 6 & 5 \end{bmatrix}$ to normal form and hence find the rank.	**L1,L2,L3**
4.	Reduce the matrix $\begin{bmatrix} 1 & 2 & 3 & 0 \\ 2 & 4 & 3 & 2 \\ 3 & 2 & 1 & 3 \\ 6 & 8 & 7 & 5 \end{bmatrix}$ to normal form and hence find the rank.	**L1,L2,L3**
5.	Solve $x+2y+z=4$, $2x-y+3z=9$, $3x-y-z=2$	**L1,L2,L3**
6.	Solve the system $x-y+z=2, 3x-y+2z=-6, 3x+y+z=-18$	**L1,L2,L3**
7.	Show that the system of equations , if they are consistent $x+y+z=6, x+2y+3z=14, x+4y+7z=30$ is consistent and solve them	**L1,L2,L3**
8.	Solve $4x+2y+z+3w=0$, $6x+3y+4z+7w=0$, $2x+y+w=0$	**L1,L2,L3**
9.	Investigate for what values of a & b the equations $x+y+z=6$, $x+2y+3z=10$, $x+2y+az=b$ have i) Unique solution ii) Infinite solutions iii) No solution	**L1,L2,L3**
10.	Find the Eigen values & Eigen vectors of the matrix $\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$	**L1,L2,L3**
11.	Find the Eigen values & Eigen vectors of the matrix $\begin{bmatrix} 3 & -4 & 3 \\ 1 & 0 & 1 \\ 1 & 2 & -1 \end{bmatrix}$	**L1,L2,L3**
12.	Find the Eigen values & Eigen vectors of the matrix $\begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$	**L1,L2,L3**

13.	Verify Cayley – Hamilton theorem and hence find the A^{-1} and A^4 where $A=\begin{bmatrix}1 & -2 & 2\\ 1 & -2 & 3\\ 0 & -1 & 2\end{bmatrix}$	**L1,L2,L3**
14.	Verify Cayley – Hamilton theorem and hence find the A^{-1} and A^4 where $A=\begin{bmatrix}1 & 2 & 0\\ 2 & -1 & 0\\ 0 & 0 & -1\end{bmatrix}$	**L1,L2,L3**
15.	Diagonalize the matrix $A=\begin{bmatrix}1 & 0 & -1\\ 1 & 2 & 1\\ 2 & 2 & 3\end{bmatrix}$	**L1,L2,L3**

Q No.	**Questions**	**BLOOMS TAXONOMY**
	UNIT – 2: DIFFERENTIAL CALCULUS AND ITS APPLICATIONS	
	PART-A (Two Marks Questions)	
1.	State Rolle's theorem	**L1**
2.	State Lagrange's mean value theorem	**L1**
3.	Discuss the applicability of Rolle's theorem for $f(x) = 1/x^3$ on [-3,3]	**L1,L2,L3**
4.	What is c value in Rolle's theorem for $f(x) = x^2$ on [-1,1]	**L1,L2,L3**
5.	Discuss the applicability of Role's theorem for $f(x)=x^2$ on [0,2]	**L1,L2,L3**
6.	State Meclaurin's series for f(x)	**L1**
7.	State Taylor's series for f(x) about x=a	**L1**
8.	Find Meclaurin's series for $f(x) = e^x$	**L1,L2,L3**
9.	Find Meclaurin's series for f(x) = cos x	**L1,L2,L3**
10.	Find Meclaurin's series for f(x) = sin x	**L1,L2**
11.	Find Meclaurin's series for f(x) = sinh x	**L1,L2**
12.	Find Meclaurin's series for f(x) = cosh x	**L1,L2**
13.	Find Meclaurin's series for f(x) = log (1+x)	**L1,L2**
14.	Obtain the Taylor's Series Expansion of e^x about x= -1	**L1,L2,L3**
15.	Define Jacobian function	**L1**
16.	$if \quad x = r\cos\theta, y = r\sin\theta, find \dfrac{\partial(x,y)}{\partial(r,\theta)}$	**L1,L2,L3**
17.	Define Meclaurin's series for f(x,y)	**L1**
18.	Define Taylor's series for f(x,y)	**L1**
19.	Find the Stationary points of $x^2 + y^2 + 6x + 12$	**L1,L2,L3**
20.	What is the process in Lagrange's method of undetermined multipliers	**L1**

Question No.	Questions	BLOOMS TAXONOMY
UNIT – 2: DIFFERENTIAL CALCULUS AND ITS APPLICATIONS		
PART-B (Ten Marks Questions)		
1.	Verify Roll's theorem for $f(x) = e^x(\sin x - \cos x)$ on $\left[\frac{\pi}{4}, \frac{5\pi}{4}\right]$	**L1,L2,L3**
2.	Verify Roll's theorem for $f(x) = (x-a)^m(x-b)^n on\ [a,b]\ b > a; m\&n \in Z^+$	**L1,L2,L3**
3.	Verify Roll's theorem for $f(x) = x(x+3)e^{-\frac{x}{2}}$ on[-3,0]	**L1,L2,L3**
4.	Show that $\frac{b-a}{1+b^2} < tan^{-1}b - tan^{-1}a < \frac{b-a}{1+a^2}$, a<b and deduce $\frac{\pi}{4} + \frac{3}{25} < tan^{-1}(4/3) < \frac{\pi}{4} + \frac{1}{6}$	**L1,L2,L3**
5.	Verify Lagrange's theorem for $f(x) = e^{-x}$ on $[-1,1]$	**L1,L2,L3**
6.	Expand log(1+ e^x) is ascending powers of x	**L1,L2,L3**
7.	Obtain the Taylor's series expansion of sin x in powers of $x - \frac{\pi}{4}$	**L1,L2,L3**
8.	Expand $f(x,y) = x^2 + xy + y^2$ in powers of (x-1) and (y-2) using Taylor's series	**L1,L2,L3**
9.	If $u = \frac{yz}{x}; v = \frac{zx}{y}; w = \frac{xy}{z}, show that \frac{\partial(u,v,w)}{\partial(x,y,z)} = 4$	**L1,L2,L3**
10.	If x + y + z = u, y + z = uv, z = u v w then evaluate $\frac{\partial(x,y,z)}{\partial(u,v,w)}$.	**L1,L2,L3**
11.	Prove that u = x + y + z , v = xy + yz+ zx, w = $x^2+y^2+z^2$ are functionally dependent and find the relation between them.	**L1,L2,L3**
12.	Find the maximum and minimum values of $x^3 + y^3 - 3axy, a > 0$	**L1,L2,L3**
13.	A rectangular box open at the top has a capacity of 32 cubic feet. Find the dimensions of the box requiring least material for its construction	**L1,L2,L3**
14.	Find the volume of the largest rectangular parallelepiped that can be inscribed in the ellipsoid $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$	**L1,L2,L3**
15.	Find the minimum value of $x^2 + y^2 + z^2$ $given\ that\ xyz = a^3$	**L1,L2,L3**

Question No.	Questions	BLOOMS TAXONOMY
UNIT – 3: MULTIPLE INTEGRALS		
PART-A (Two Marks Questions)		
1.	Evaluate $\int_0^3\int_0^5 (x+y)dydx$	**L1,L2,L3**
2.	Evaluate $\int_0^3\int_0^2 (x+y)^2 dxdy$	**L1,L2,L3**
3.	Evaluate $\int_0^2\int_0^3 dydx$	**L1,L2,L3**
4.	Evaluate $\int_0^3\int_0^{-2} xydxdy$	**L1,L2,L3**

5.	Evaluate $\int_0^1\int_0^1 x^2y^3dxdy$	**L1,L2,L3**
6.	Evaluate $\int_0^1\int_0^x e^{x+y}$dydx	**L1,L2,L3**
7.	Evaluate $\int_0^{\pi/2}\int_{-1}^1 x^2y^2$ dxdy	**L1,L2,L3**
8.	Evaluate $\int_{-1}^2\int_{x^2}^{x+2} dydx$	**L1,L2,L3**
9.	Evaluate $\int_0^5\int_0^{x^2}(x^2+y^2)$ dy dx	**L1,L2,L3**
10.	Evaluate $\int_0^1\int_0^1 \frac{dxdy}{\sqrt{1-x^2}\sqrt{1-y^2}}$	**L1,L2,L3**
11.	Evaluate $\int_0^{\pi}\int_0^{asin\theta} rdrd\theta$	**L1,L2,L3**
12.	Evaluate $\int_0^{\infty}\int_0^{\pi/2} e^{-r}$ dθdr	**L1,L2,L3**
13.	Find the limits of integration of $\iint xy$ dydx over the region in first Quadrant bounded by circle $x^2+y^2=1$	**L1,L2,L3**
14.	What is the process for evaluation of double integral by Changing the order of integration	**L1,L2,L3**
15.	What is the process for evaluation of double integral Changing of Cartesian to polar system	**L1,L2,L3**
16.	Evaluate $\int_{-1}^1\int_{-2}^2\int_{-3}^3 dxdydz$	**L1,L2,L3**
17.	Evaluate $\int_0^1\int_0^2\int_0^3 ydxdydz$	**L1,L2,L3**
18.	Evaluate $\int_0^1\int_0^1\int_0^1 xdxdydz$	**L1,L2,L3**
19.	Evaluate $\int_0^1\int_1^2\int_1^3 xyzdxdydz$	**L1,L2,L3**
20.	Evaluate $\int_0^1\int_1^2\int_2^3(x+y+z)dxdy\,dz$	**L1,L2,L3**
PART-B (Ten Marks Questions)		
1.	Evaluate$\int_0^5\int_0^{x^2} x(x^2+y^2)dx\,dy$	**L1,L2,L3**
2.	Evaluate $\int_0^a\int_0^{\sqrt{a^2-y^2}} \sqrt{a^2-x^2-y^2}$ dx.dy	**L1,L2,L3**
3.	Evaluate $\int_a^{2a}\int_0^{\sqrt{2ax-x^2}}$ xy dy dx	**L1,L2,L3**
4.	Evaluate$\int_0^1\int_0^{\sqrt{1+X^2}}\frac{dydx}{1+x^2+y^2}$	**L1,L2,L3**
5.	Evaluate $\int_1^2\int_1^z\int_0^{yz}(xyz)dx\,dy\,dz$	**L1,L2,L3**

6.	Evaluate $\int_0^a \int_0^x \int_0^{x+y} e^{(x+y+z)}\, dz\, dy\, dx$	**L1,L2,L3**
7.	Evaluate $\int_{-1}^1 \int_0^z \int_{x-z}^{x+z} (x+y+z) dx\, dy\, dz$	**L1,L2,L3**
8.	Evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} xyz dz dy dx$	**L1,L2,L3**
9.	Evaluate $\int_0^{\pi} \int_0^{a(1+\cos\theta)} r\, dr\, d\theta$	**L1,L2,L3**
10.	Evaluate $\int_0^{\pi/2} \int_0^{a\cos\theta} r\sin\theta\, dr\, d\theta$	
11.	Evaluate $\iint_R (x^2+y^2)\, dxdy$ where R is the region bounded by y = x and y^2=4x	**L1,L2,L3**
12.	Evaluate $\iint_R xy\, dxdy$ where R is the region bounded by X-axis, x=2a and the curve x^2 = 4ay	**L1,L2,L3**
13.	Change the order of integration and evaluates $\int_0^1 \int_x^{\sqrt{x}} xydy\, dx$	**L1,L2,L3**
14.	Change the order of integration and evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} y^2 dy\, dx$	**L1,L2,L3**
15.	Evaluate $\iiint_V (x^2+y^2+z^2)\, dz\, dy\, dx$ where V is the volume of the cube bounded by x=0,y=0,z=0,x=a,y=b,z=c	**L1,L2,L3**

Question No.	Questions	BLOOMS TAXONOMY
UNIT – 4: VECTOR DIFFERENTIATION		
PART-A (Two Marks Questions)		
1.	Find $grad\ f$ of the function $f = x^2 - y^2 + 2z^2$	**L1,L2,L3**
2.	Find $grad\ f$ of the function $f = xy^2 + yz^2 + zx^2$	**L1,L2,L3**
3.	Find $grad\ f$ of the function f=xy+2yz-8 at (3,-2,1)	**L1,L2,L3**
4.	Find the normal vector to the surface $x^2 + y^2 + 2z^2 = 26$ at the point $(2,2,3)$	**L1,L2,L3**
5.	Find the normal vector to the surface $z = x^2 + y^2$ at the point (-1,-2,5)	
6.	What is Solenoidal vector?	**L1**
7.	What is divergence of a vector?	**L1**
8.	What is Curl of a vector?	**L1**
9.	What is Irrotational vector?	**L1**
10.	Find $div\ \bar{f}$ where $\bar{f} = x^2 i + y^2 j + z^2 k$	**L1,L2,L3**
11.	Find $div\ \bar{f}$ where $\bar{f} = xy^2 i + 2x^2 yzj - 3yz^2 k$	
12.	Find $curl\ \bar{f}$ for $\bar{f} = 2xz^2\, \bar{i} - yz\, \bar{j} + 3xz^3\, \bar{k}$	**L1,L2,L3**

13.	Find $curl\,\bar{f}$ for $\bar{f} = z\bar{i} + x\bar{j} + y\bar{k}$	**L1,L2,L3**
14.	Show that $curl\,\bar{r} = 0$ where $\bar{r} = x\bar{i} + y\bar{j} + z\bar{k}$	**L1,L2,L3**
15.	Show that $\bar{f} = 3y^4z^2i + z^3x^2j - 3x^2y^2k$ is solenoidal	**L1,L2,L3**
16.	Find p when $\bar{f} = (x+3y)i + (y-2z)j + (x+pz)k$ is solenoidal	**L1,L2,L3**
17.	Show that $\bar{f} = (y+z)\bar{i} + (z+x)\bar{j} + (x+y)\bar{k}$ is irrotational.	**L1,L2,L3**
18.	Find div $\bar{r}$ where $\bar{r} = x\bar{i} + y\bar{j} + z\bar{k}$	**L1,L2,L3**
19.	Find $grad\ f$ of the function f = x + y + z	**L1,L2,L3**
20.	Find $curl\,\bar{f}$ for $\bar{f} = x^2\,i + yz\,j + zx\,k$	**L1,L2,L3**
	PART-B (Ten Marks Questions)	
1.	a)Find a unit normal vector to the surface $z = x^2 + y^2\ at\ (-1,-2,5)$	**L1,L2,L3**
	b) If $\emptyset = 2x^3y^2z^4, then\ find\ div(grad\ \emptyset)$	**L1,L2,L3**
2.	Find div $\bar{f}$ and curl $\bar{f}$ where $\bar{f} = grad\ (x^3 + y^3 + z^3 - 3xyz)$	**L1,L2,L3**
3.	a) If $\bar{f} = xy^2i + 2x^2yzj - 3yz^2k\ then\ find\ div\ \bar{f}$ at (1,-1,1)	**L1,L2,L3**
	b)Find the greatest value of the directional derivative of the function $f = x^2yz^3$ at $(2,1,-1)$	**L1,L2,L3**
4.	Find div $\bar{f}$ and curl $\bar{f}$ where $\bar{f} = (x^2 - y^2)i + 4xy\,j + (x^2 - xy)k$	**L1,L2,L3**
5.	Find div $\bar{f}$ and curl $\bar{f}$ where $\bar{f} = (x^2 + yz)i + (y^2 + zx)\,j + (z^2 + xy)k$	**L1,L2,L3**
6.	Show that V= (sin y + z)i+(x cos y – z)j+(x-y)k is irrotational	**L1,L2,L3**
7.	Find the directional derivative of $f = xy + yz + zx$ in the direction of the vector $\bar{i} + 2\bar{j} + 2\bar{k}$ at the point $(1,2,0)$.	**L1,L2,L3**
8.	Find the directional derivative of $f = 2xy + z^2$ at $(1,-1,3)$ in the direction of the vector $\bar{i} + 2\bar{j} + 3\bar{k}$.	**L1,L2,L3**
9.	Find the directional derivative of $f(x,y,z) = 2x^2 + 3y^2 + z^2$ at (2,1,3) in the direction of the vector i-2k	**L1,L2,L3**
10.	Find the directional derivative of $f = x^2 - y^2 + 2z^2$ at the point $P = (1, 2, 3)$ in the direction of the line PQ where $Q = (5, 0, 4)$	**L1,L2,L3**
11.	Find the angle between the surfaces $x^2 + y^2 + z^2 = 9$ and $z = x^2 + y^2 - 3$ at the point $(2, -1, 2)$.	**L1,L2,L3**
12.	Show that $\nabla\, r^n = n\, r^{n-2}\,\bar{r}\ wher\ \bar{r} = xi + yj + zk$ and $r = \lvert\bar{r}\rvert$	**L1,L2,L3**
13.	Evaluate $\nabla.\left(\frac{\bar{r}}{r^3}\right)$ where $\bar{r} = xi + yj + zk$ and $r = \lvert\bar{r}\rvert$	**L1,L2,L3**

14.	Show that $curl(r^n \bar{r}) = 0$	**L1,L2,L3**
15.	Find the constants a, b and c if the vector $\bar{f} = (2x+3y+az)\bar{i} + (bx+2y+3z)\bar{j} + (2x+cy+3z)\bar{k}$ is Irrotational	**L1,L2,L3**

Question No.	**Questions**	**BLOOMS TAXONOMY**
	UNIT – 5: VECTOR INTEGRATION	
	PART-A (Two Marks Questions)	
1.	Define Line integral?	**L1**
2.	Define Surface integral?	**L1**
3.	Define Volume integral?	**L1**
4.	If $\bar{F} = x\,i - y\,j$ then evaluate $\int_C \bar{F}.dr$ where C is the line $y = x$ in the xy plane from (0,0) to (1,2)	**L1,L2,L3**
5.	If $\bar{F} = x\,i + y\,j$ then evaluate $\int_C \bar{F}.dr$ where C is the line $y = x^2$ in the xy plane from (0,0) to (1,1)	**L1,L2,L3**
6.	If $\bar{F} = x^2\,i - y^2\,j$ then evaluate $\int_C \bar{F}.dr$ where C is the curve x=t, y=t in the xy plane from t=0 to t=1.	**L1,L2,L3**
7.	What are the limits of x &y in the integral $\iint_R xy\,dx\,dy$ where R is the region bounded by x=0,y=0 and x+y=1	**L1,L2,L3**
8.	What are the limits of x ,y &z in the integral $\iiint_V xyz\,dxdydz$ where v is the volume of the cube x=0, y=0, z=0, x=a, y=a, z=a	**L1,L2,L3**
9.	For any closed surface S, $\iint_S curl\,\bar{F}.\bar{n}\,dS$ by Gauss divergence theorem is?	**L1,L2,L3**
10.	State Stoke's theorem.	**L1**
11.	State Gauss Divergence theorem.	**L1**
12.	State Green's theorem.	**L1**
13.	Convert $\int_C (2xy - x^2)dx + (x^2 + y^2)dy$ into double integral over a region R by Green's theorem, where C is a simple closed curve bounded by a region R.	**L1,L2,L3**
14.	Convert $\int_C (3x^2 - 8y^2)dx + (4y - 6xy)dy$ into double integral over a region R by Green's theorem, where C is a simple closed curve bounded by a region R.	**L1,L2,L3**
15.	Convert $\int_S \bar{F}.\bar{n}\,dS$ where $\bar{F} = xyi + z^2j + 2yzk$, into triple integrals over V by Gauss divergence theorem, where S is the closed surface bounded a region V.	**L1,L2,L3**
	PART-B (Ten Marks Questions)	
1.	If $\bar{F} = 3xy\,i - y^2\,j$ then evaluate $\int_C \bar{F}.dr$ where C is the curve $y = 2x^2$ in the xy plane from (0,0) to (1,2)	**L1,L2,L3**
2.	If $\bar{F} = (5xy - 6x^2)i + (2y - 4x)\,j$ then evaluate $\int_C \bar{F}.dr$ where C is the curve $y = x^3$ in the xy plane from (1,1) to (2,8)	**L1,L2,L3**
3.	If $\bar{F} = y\,i - x\,j$ then evaluate $\int_C \bar{F}.dr$ where C is the curve $y = x^2$ in the xy plane from (0,0) to (1,1)	**L1,L2,L3**

4.	If $\bar{F} = y\,i - x\,j$ then evaluate $\int_C \bar{F}.dr$ where C is straight line joining (0,0) and (1,1)	**L1,L2,L3**
5.	Find the work done in moving a particle in the force field $\bar{F} = 3x^2\,\bar{i} + (2xz - y)\,\bar{j} + z\,\bar{k}$ along the straight line from (0,0,0) to (2,1,3).	**L1,L2,L3**
6.	If $\bar{F} = xy\,\bar{i} - z\,\bar{j} + x^2\,\bar{k}$ and C is the curve $x = t^2, y = 2t, z = t^3$ from $t = 0$ to $t = 1$. Evaluate $\int_C \bar{F}.d\bar{r}$.	**L1,L2,L3**
7.	Evaluate $\int_S \bar{F}.\bar{n}\,dS$, where $\bar{F} = 18zi - 12j + 3yk$, and S is the part of the surface of the plane 2x+3y+6z=12 located in the first octant.	**L1,L2,L3**
8.	Evaluate $\int_S \bar{F}.\bar{n}\,dS$, where $\bar{F} = yz\,i + zx\,j + xy\,k$, and S is the part of the surface of the sphere $x^2 + y^2 + z^2 = 1$ located in the first octant.	**L1,L2,L3**
9.	Evaluate $\int_C \left[\left(3x^2 - 8y^2\right)dx + \left(4y - 6xy\right)dy\right]$ where C is the region bounded by $x = 0,\ y = 0$ and $x + y = 1$ by Green's Theorem.	**L1,L2,L3**
10.	Verify Green's theorem for $\int_C [(xy + y^2)dx + x^2dy]$ where C is bounded by y = x and y = x^2.	**L1,L2,L3**
11.	Evaluate by Green's theorem $\int_C (y - \sin x)\,dx + \cos x\,dy$ where C is the triangle enclosed by the lines y=0,x=$\frac{\pi}{2}$, $\pi y = 2x$	**L1,L2,L3**
12.	Evaluate by Green's theorem $\int_C (x^2 - \cosh y)\,dx + (y + \sin\,x)\,dy$ where C is the rectangle with vertices (0,0),$(\pi, 0), (\pi, 1) and$ (0,1)	**L1,L2,L3**
13.	Verify Green's theorem $\int_C (3x^2 - 8y^2)dx + (4y - 6xy)dy$ where C is bounded by y^2 = x and y = x^2.	**L1,L2,L3**
14.	Using Divergence theorem, evaluate $\iint_S (x\,dy\,dz + y\,dz\,dx + z\,dx\,dy)$, where $x^2 + y^2 + z^2 = a^2$.	**L1,L2,L3**
15.	Verify Stoke's theorem for the function $\bar{F} = x^2i + xyj$ integrated round the square in the plan z=0 whose sides are along the lines x=0,y=0,x=a,y=a.	**L1,L2,L3**