NAME : PRATHAPANI SATWIKA

REG.NO. : 20BCD7160

EXPERIMENT NO.4 – Vector Calculus

1.

```
clc
clear all
syms x y z
f=x*y*z;
F=[(x^2)*y,y,y*z];
vars=[x, y, z];
fprintf('20BCD7160 Prathapani Satwika')
grad=gradient(f, vars);
divf=divergence(F, vars)
curlf=curl(F, vars)

```

Command Window

```
20BCD7160 Prathapani Satwika
divf =

y + 2*x*y + 1


curlf =

   z
   0
-x^2

fx >>
```

2.

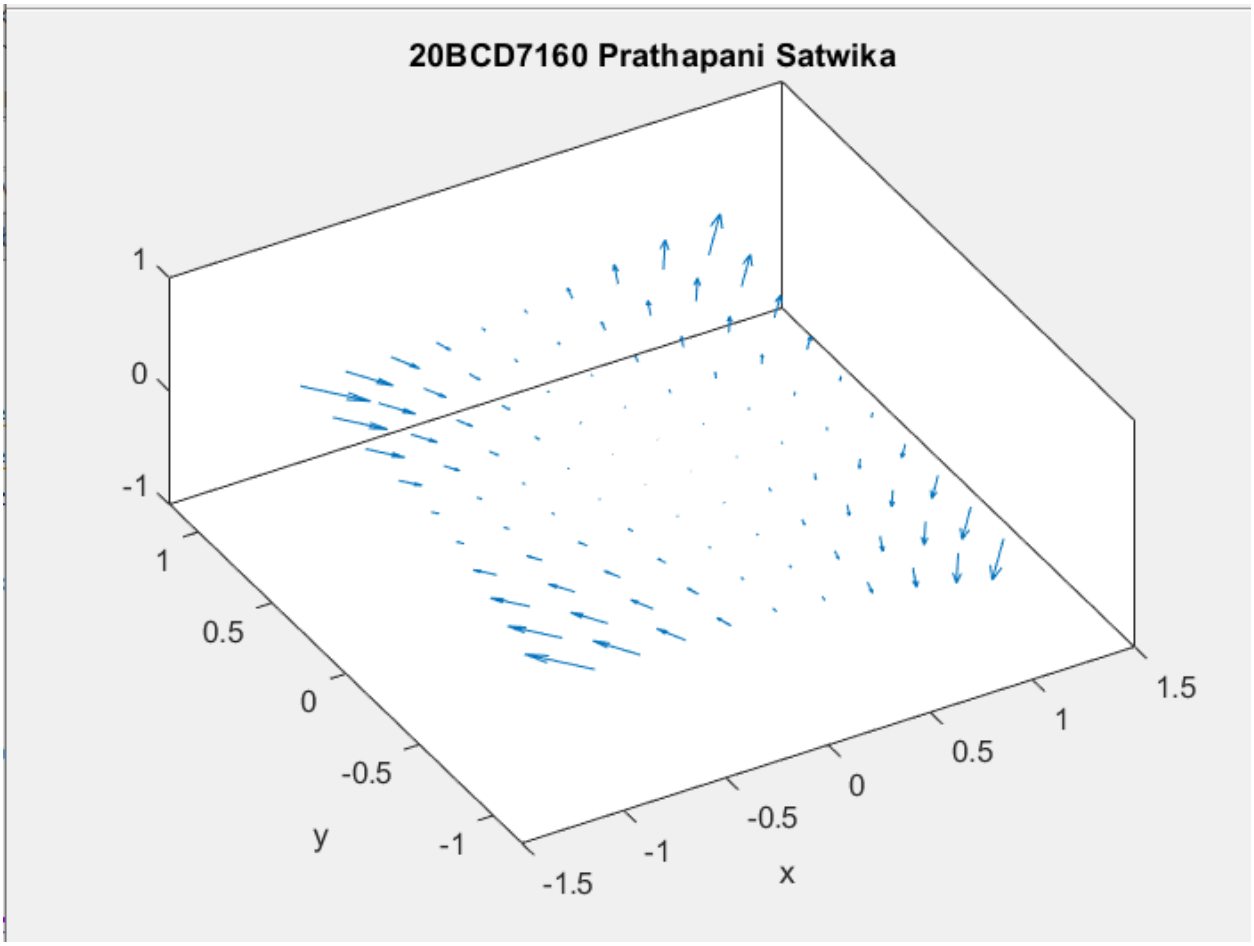
```
clc
clear all
syms x y z
f=x*cos(y*z);
vars=[x, y, z];
P=[-1,2,1];
u=[2,1,3];
norm(u);
unitu =u./norm(u);
fprintf('20BCD7160 Prathapani Satwika')
grad = gradient(f, vars)
gradval=subs(grad, vars, P);
DirDer = double(dot(gradval,unitu))
```

Command Window

```
20BCD7160 Prathapani Satwika
grad =

     cos(y*z)
-x*z*sin(y*z)
-x*y*sin(y*z)


DirDer =

    1.4787

fx >>
```

3.

```
clc
clear all
syms x y
f1 = inline((x^2)*y,'x','y');
f2 = inline(x*y,'x','y');
x = linspace(-1, 1, 10);
y = x;
[X,Y] = meshgrid(x,y);
U = f1(X,Y);
V = f2(X,Y);
quiver(X,Y,U,V,1)
view(-30,60);
axis on
xlabel('x')
ylabel('y')
title('20BCD7160 Prathapani Satwika')
```


20BCD7160 Prathapani Satwika
1
0
-1
1
0.5
0
-0.5
-1
y
-1.5
-1
-0.5
0
0.5
1
1.5
x