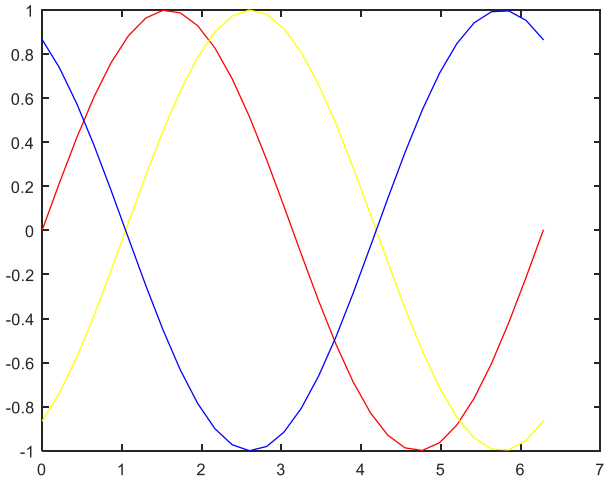
ECE 2017

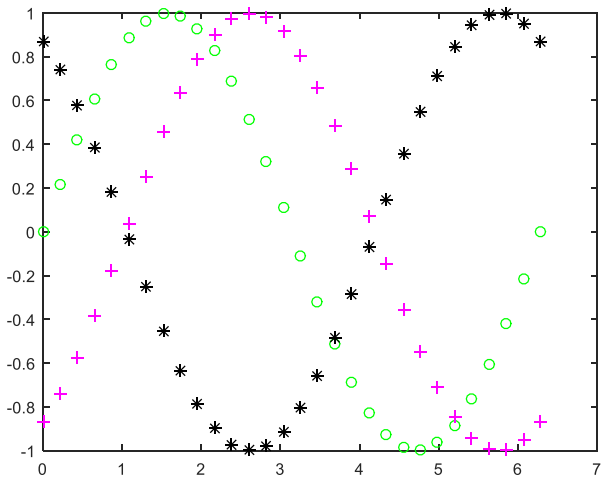
16BMD0016
Ritobrita De

TASK-2

Explain each of the lines of code & the output of the MATLAB program given:

```
1.
t=linspace(0,2*pi,30); %Create Linearly spaced vector within limits
vr=sin(t); %Symbolic sine function
vy=sin(t-(2*pi)/6);
vb=sin(t+(2*pi)/3);
figure(1)
plot(t,vr,'r',t,vy,'y',t,vb,'b');  %2-D line plot with different colours
figure(2)
plot(t,vr,'go',t,vy,'m+',t,vb,'k*'); %Plot with different symbols
```





Linspace: Generate linearly spaced vector between given limits

Plot: Creates a 2-D line plot of the data in vr versus the corresponding values in t with different specified colours like Blue, Red, and Yellow.

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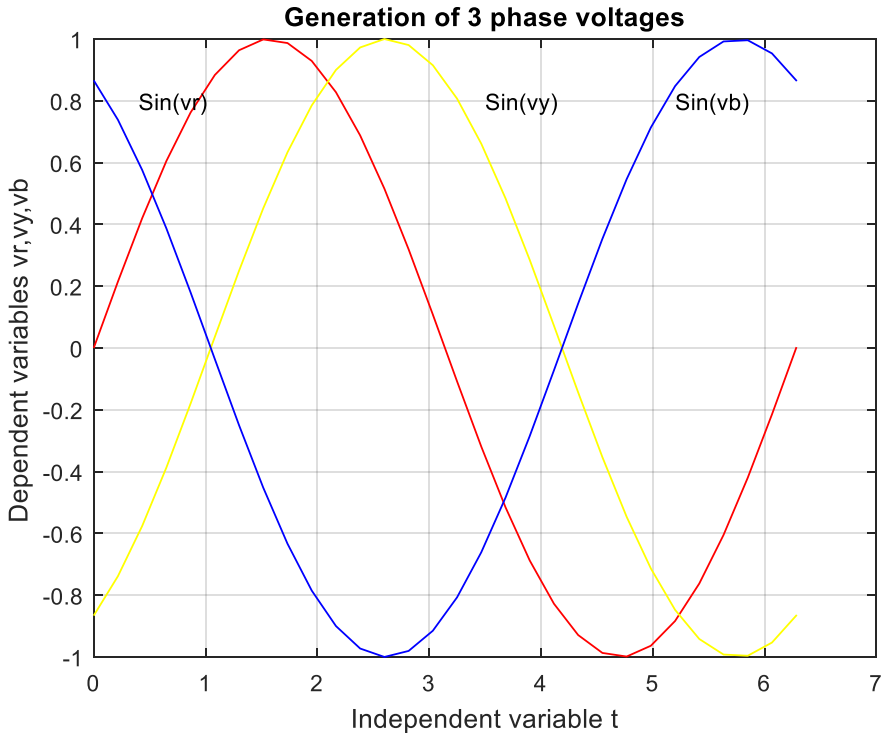
2.

```
t=linspace(0,2*pi,30);
vr=sin(t);
vy=sin(t-(2*pi)/6);
vb=sin(t+(2*pi)/3);
plot(t,vr,'r',t,vy,'y',t,vb,'b');
grid
text(0.4,0.8,'Sin(vr)');  %Adds Description to Coordinates given
text(3.5,0.8,'Sin(vy)');
text(5.2,0.8,'Sin(vb)');
title('Generation of 3 phase voltages');
xlabel('Independent variable t');
ylabel('Dependent variables vr,vy,vb');
```



Text: Adds text in the specific coordinates specified.

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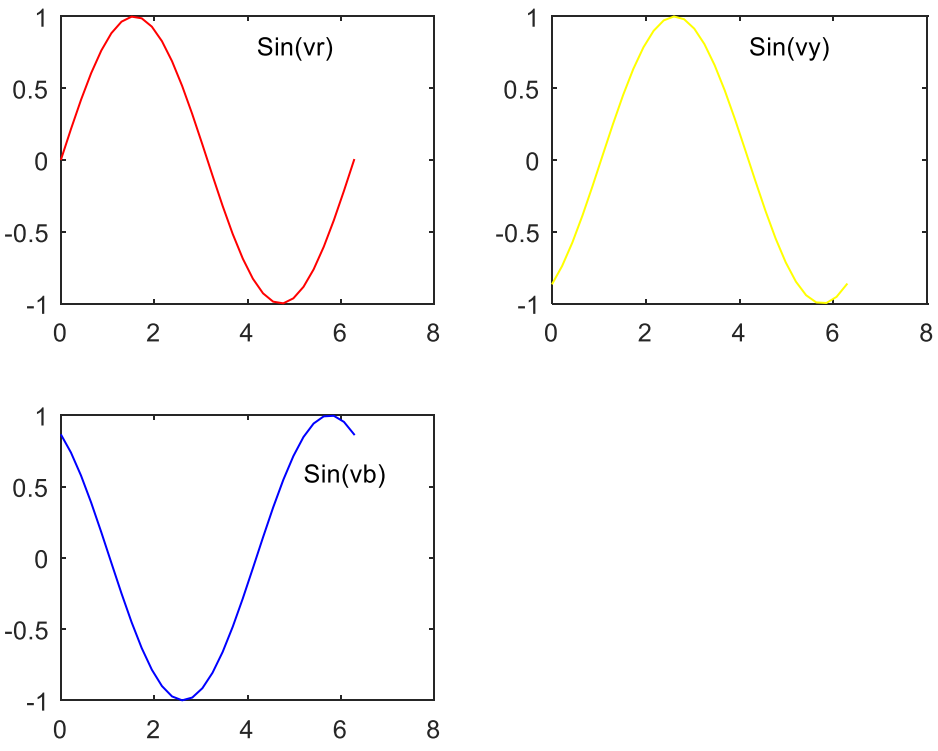
3.

```
t=linspace(0,2*pi,30);
vr=sin(t);
vy=sin(t-(2*pi)/6);
vb=sin(t+(2*pi)/3);
subplot(2,2,1); %Subplots created
plot(t,vr,'r');
text(4.2,0.8,'Sin(vr)'); %Adds Description to Coordinates given

subplot(2,2,2);
plot(t,vy,'y');
text(4.2,0.8,'Sin(vy)');

subplot(2,2,3);
plot(t,vb,'b');
text(5.2,0.6,'Sin(vb)');
```



SubPlot: `subplot(m,n,p)` divides the current figure into an `m`-by-`n` grid and creates axes. The first subplot is the first column of the first row, the second subplot is the second column of the first row, and so on. If axes exist in the specified position, then this command makes the axes the current axes.

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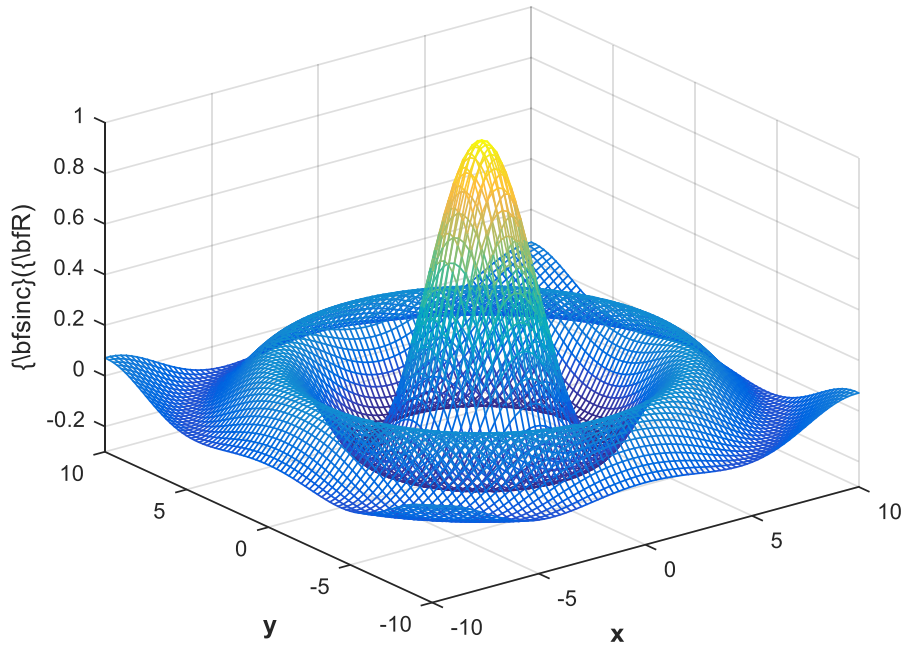
4.

```
[x,y]=meshgrid(-10:0.25:10,-10:0.25:10);
f=sinc(sqrt((x/pi).^2+(y/pi).^2));
mesh(x,y,f); %Mesh Plot
axis([-10 10 -10 10 -0.3 1]) %Set axis limits and aspect ratios
xlabel('{\bfx}')
ylabel('{\bfy}')
zlabel('{\bfsinc}({\bfR})')
hidden off %Remove Hidden Lines from Plot
```



Mesh: mesh(X,Y,Z) draws a wireframe mesh with color determined by Z, so color is proportional to surface height. If X and Y are vectors, length(X) = n and length(Y) = m, where [m,n] = size(Z). In this case, (X(j), Y(i), Z(i,j)) are the intersections of the wireframe grid lines; X and Y correspond to the columns and rows of Z, respectively. If X and Y are matrices, (X(i,j), Y(i,j), Z(i,j)) are the intersections of the wireframe grid lines. The values in X, Y, or Z can be numeric, datetime, duration, or categorical values.

Hidden Off: Hidden line removal draws only those lines that are not obscured by other objects in a 3-D view. The hidden function only applies to surface plot objects that have a uniform FaceColor. **Hidden off** turns off hidden line removal for the current mesh plot.

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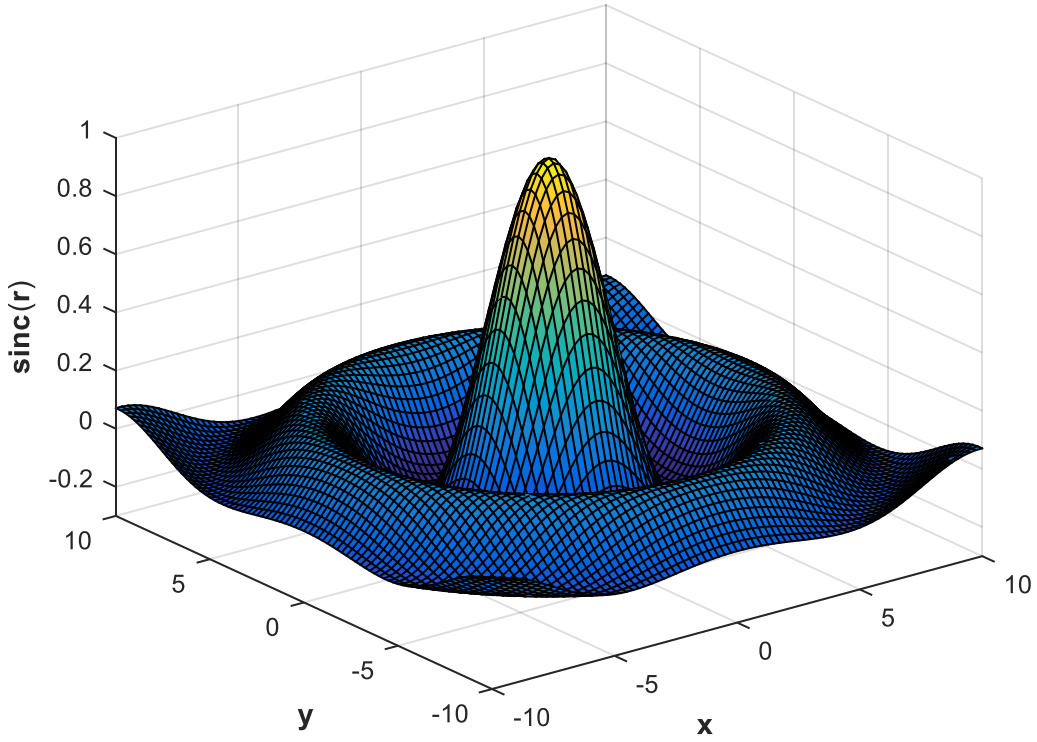
5.

```
[x,y]=meshgrid(-10:0.25:10,-10:0.25:10);
f=sinc(sqrt((x/pi).^2+(y/pi).^2));
surf(x,y,f); %Creates a 3-D surface plot
axis([-10 10 -10 10 -0.3 1])
xlabel('{\bfx}')
ylabel('{\bfy}')
zlabel('{\bfsinc}({\bfr})')
```



Surf: surf(X,Y,Z) creates a three-dimensional surface plot. The function plots the values in matrix Z as heights above a grid in the x-y plane defined by X andY. The function also uses Z for the color data, so color is proportional to height.