Explain crt with diagram
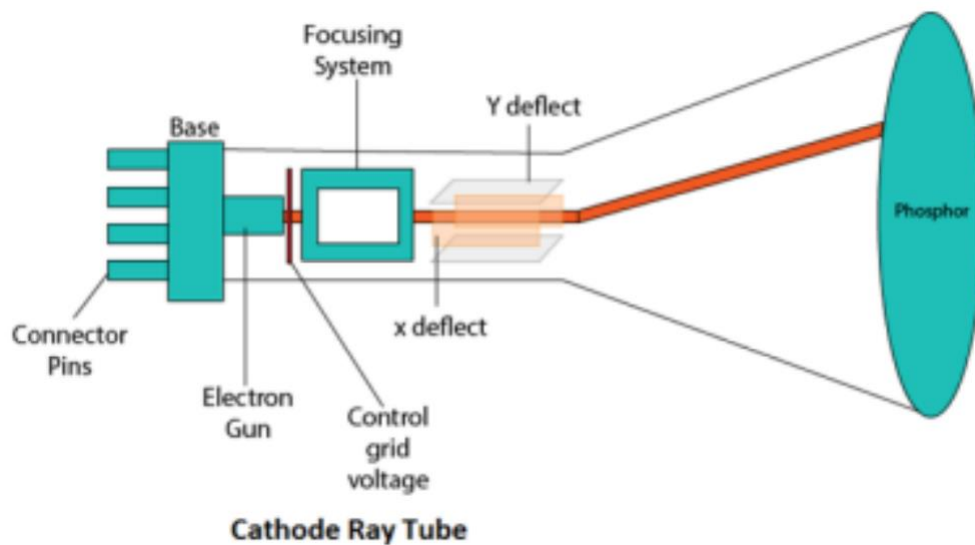

Cathode Ray Tube

Ans -

CRT stands for Cathode Ray Tube. CRT is a technology used in traditional computer monitors and televisions. The image on CRT display is created by firing electrons from the back of the tube of phosphorus located towards the front of the screen.

Once the electron heats the phosphorus, they light up, and they are projected on a screen. The color you view on the screen is produced by a blend of red, blue and green light

Components of CRT:

 1. Electron Gun: Electron gun consisting of a series of elements, primarily a heating filament (heater) and a cathode. The electron gun creates a source of electrons which are focused into a narrow beam directed at the face of the CRT.

 2. Control Electrode: It is used to turn the electron beam on and off.

 3. Focusing system: It is used to create a clear picture by focusing the electrons into a narrow beam. 4. Deflection Yoke: It is used to control the direction of the electron beam. It creates an electric or magnetic field which will bend the electron beam as it passes through the area. In a conventional CRT, the yoke is linked to a sweep or scan generator. The deflection yoke which is connected to the sweep generator creates a fluctuating electric or magnetic potential. 5. Phosphorus-coated screen: The inside front surface of every CRT is coated with phosphors. Phosphors glow when a high-energy electron beam hits them. Phosphorescence is the term used to characterize the light given off by a phosphor after it has been exposed to an electron beam.

Difference between Active and Passive graphic devices.

Ans-

Active devices	Passive devices
it is dynamic in nature	It is static in nature
It provides two-way communication between user and computer	It provides one way communication only through computer
Control is provided to user to manipulate the graphics	Control is not provided to user to manipulate the graphics. It works on already written instructions
Modern application	Older application
Higher bandwidth user interaction with hardware devices	No interaction between user and hardware devices
Facility available which supports 2D and 3D transformation	No facility available which supports 2D and 3D transformation
E.g.: resistors	E.g.: CRT, LED

Explain Beam penetration method for producing color display.

Ans - The CRT Monitor display by using a combination of phosphors. The phosphors are different colors. There are two popular approaches for producing color displays with a CRT are:

1. Beam penetration method

2. Shadow mask method

Beam penetration method:

The Beam-Penetration method has been used with random-scan monitors. In this method, the CRT screen is coated with two layers of phosphor, red and green and the displayed color depends on how far the electron beam penetrates the phosphor layers. This method produces four colors only, red, green, orange and yellow. A beam of slow electrons excites the outer red layer only; hence screen shows red color only. A beam of high-speed electrons excites the inner green layer. Thus screen shows a green color.

Advantages:

● Inexpensive

Disadvantages:

● Only four colors are possible

● Quality of pictures is not as good as with another method.
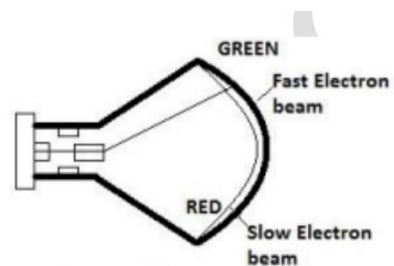
Explain DDA algorithm

Ans – digital differential analyzer - is a line drawing algo

Step 1 : y2 - y1

$\qquad$ X2 - x1

Step 2 : m = y2 - y1

$\qquad$ X2 - x1

Step 3 : $\Delta x = \Delta y/m$

$\qquad \Delta y = \Delta x.m$

Step 4 : condition 1 – if $|\Delta x| \geq |\Delta y|$

$\qquad$ Consider $\Delta x = 1$

$\qquad X_{i+1} = x_i + \Delta x$

$\qquad = x_i + 1$

$\qquad y_{i+1} = y_{i} + \Delta y$

$\qquad = y_i + \Delta x.m$

$\qquad = y_i + 1.m$

$\qquad$ condition 2 – if $|\Delta x| \leq |\Delta y|$

$\qquad$ consider $\Delta y = 1$

$\qquad X_{i+1} = x_i + \Delta x$

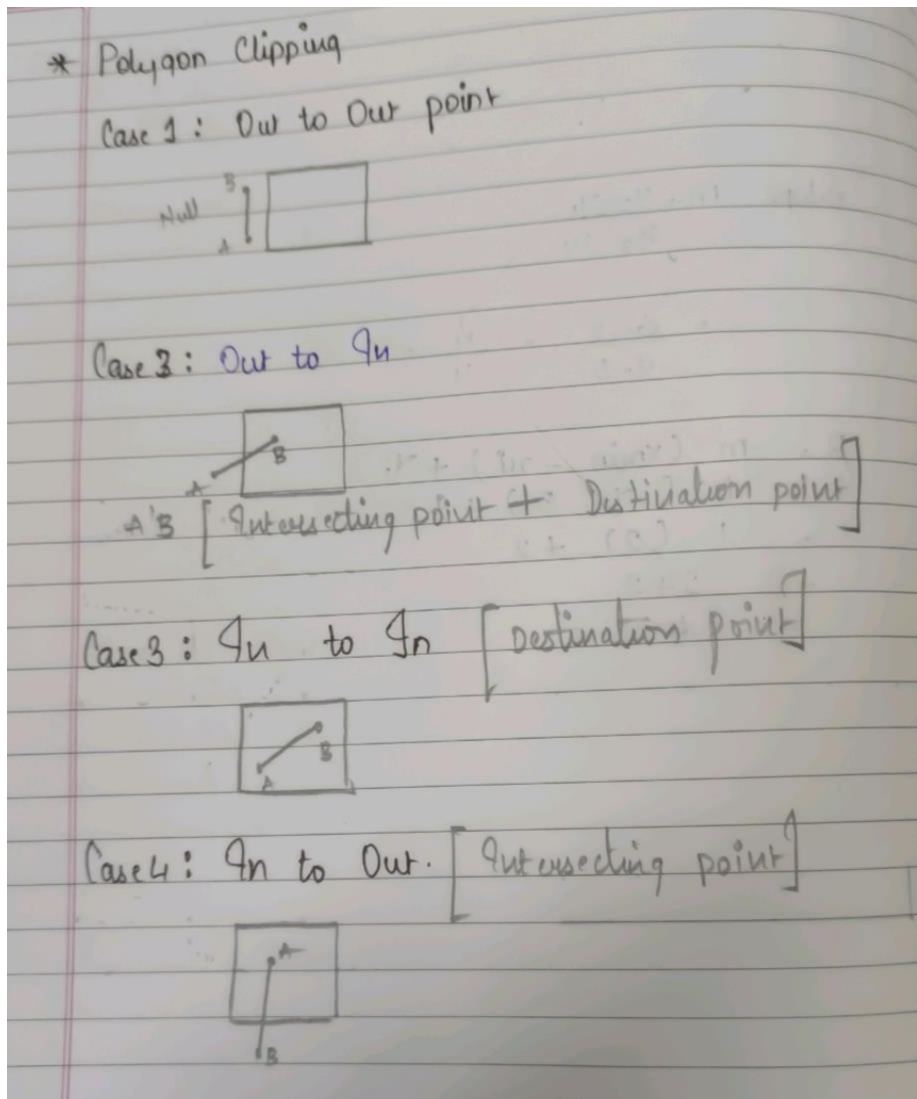$\qquad = X_i + \Delta y/m$

$\qquad = x_i + 1/m$

$\qquad y_{i+1} = y_{i} + \Delta y$

$\qquad = y_i + 1$

Explain Sutherland Hodgeman Algorithm for polygon clipping with example.
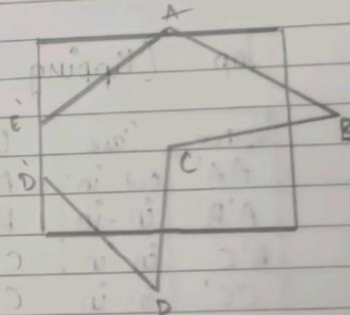
Ans –

* Polygon Clipping

Case 1 : Out to Out point

Null $\begin{array}{|c|} \hline \\ \\ \hline \end{array}$

Case 2 : Out to In

A'B [Intersecting point + Destination point]

Case 3 : In to In [Destination point]

Case 4 : In to Out. [Intersecting point]

Q1.
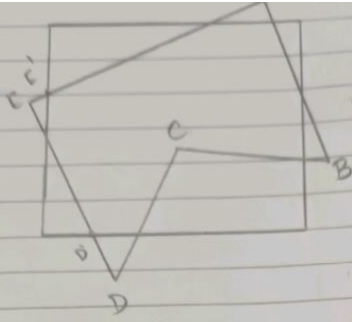
Left Clipping

Vertex	Case	O/P
AB	in - in	B
BC	in - in	C
CD	in - in	D
DE	in - Out	D'
EA	Out - in	E'A

Right Clipping

Vertex	Case	O/P
AB	in - Out	A'
BC	Out - in	B'C
CD	in - in	D
DD'	in - in	D'
D'E'	in - in	E'
E'A	in - in	A
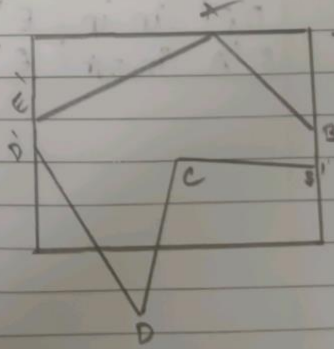
Bottom Clipping

Vertex	Case	O/P
AA'	in - in	A'
A'B'	in - in	B'
B'C	in - in	C
C D	in - out	C'
DD'	out - in	D" D'
D'E'	in - in	E'
E'A	in - out	A
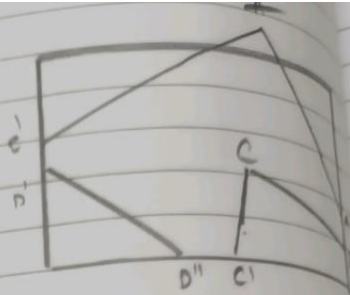
Top Clipping

Vertex	Case	O/P
AA'	out - in	A"A'
A'B'	in - in	B'
B'C	in - in	C
CC'	in - in	C'
C'D"	in - in	D"
D"D'	in - in	D'
D'E'	in - in	E'
E'A	in - out	E"