Assignment 1

Ans 1 Computer Graphics is an art of drawing pictures, lines, charts etc. using computers with the help of programming. Computer graphics is made up of number of pixels. Pixel is the smallest graphical picture or unit represented on the computer screen. Basically there are two types of computer graphics namely :-

(i) Interactive Computer Graphics
(ii) Non Interactive Computer Graphics.

Interactive Computer Graphics :-

Interactive Computer Graphics involves a two way communication between Computer and user. Here the observer is given some control over the image by providing him an input device for example the video game controller of the ping pong game. This helps him to signal his request to the computer.

Date / / Page no.

Non Interactive Computer Graphics :-

In non interactive computer graphics otherwise known as passive computer graphics is the computer in which user does not have any kind of control over the image. Image is merely the product of static stored program and will work according to the instructions given the program linearly. The image is totally under the control of program instructions not under the user

Ans 3 The main difference vector and raster graphics is that raster graphics are composed of pixels, while, vector graphics are composed of paths. A Raster graphic such as gif or jpeg, is an array of pixels of various colors, which together form a image.

Raster Graphics	Vector Graphics
(1.) They are composed pixels.	(1) They are composed of paths

Date / /

Page no.

2)	In Raster Graphics, refresh process is independent of the complexity of the image.	2) Vector displays flicker when the number of primitives in the image become too large
3)	Graphic primitives are specified in terms of end points and must be scan converted into corresponding pixels.	3) Scan conversion is not required.
4)	Raster Graphics is cost less	4) Vector graphics cost more as compared to raster graphics.
5)	They occupy more space which depends on image quality	5) They occupy less space
6)	File extensions :- BMP, TIF, GIF JPG.	6) File extension :- SVG, .EPS, .PDF, .AI .DXF

Date / /

Page no.

Ans 10) -) Shadow Mask method is commonly used in Raster-Scan system because they produce a much wider range of colors than the beam penetration method.

-) It is different from penetration method in the foll. ways:

Shadow Mask Methods	Beams penetration method.
1) Commonly use in Raster Scan method.	1) It is used in random-Scan monitors.
2) Relatively expensive when compared with the monochrome CRT.	2) Inexpensive
3) Millin different colors to be generated	3) Only four colors are possible.

Define :-

(a) Aspect Ratio :-
The aspect ratio of an image describes the proportional relationship between its width and its height. It is commonly expressed as two numbers seperated by colon.

(b) Resolution :-
In Computer resolution is the number pixels (individual points of color) contained on a display monitor expressed in terms of number of pixels on the horizontal axis and the number on the vertical axis.

(c) Bit map :-
Bit map is also called raster graphics is a digital image composed of a matrix of dots when viewed at 100%, each dot corresponds to an individual pixel on a display.

Date / /

Page no.

(d) Color depth :-

Color depth is also known as depth bit, is either the number of bits used to indicate the color of single pixel, in a bitmapped image or video, framebuffer or no. of bits used for each color component of single pixel.

Ans) Architecture of Raster Scan

- In a Raster Scan display, the image which has to displayed is saved in a binary format in refresh buffer memory.

- Then, a video controller is used to scan each and every line of the Refresh Buffer Memory.

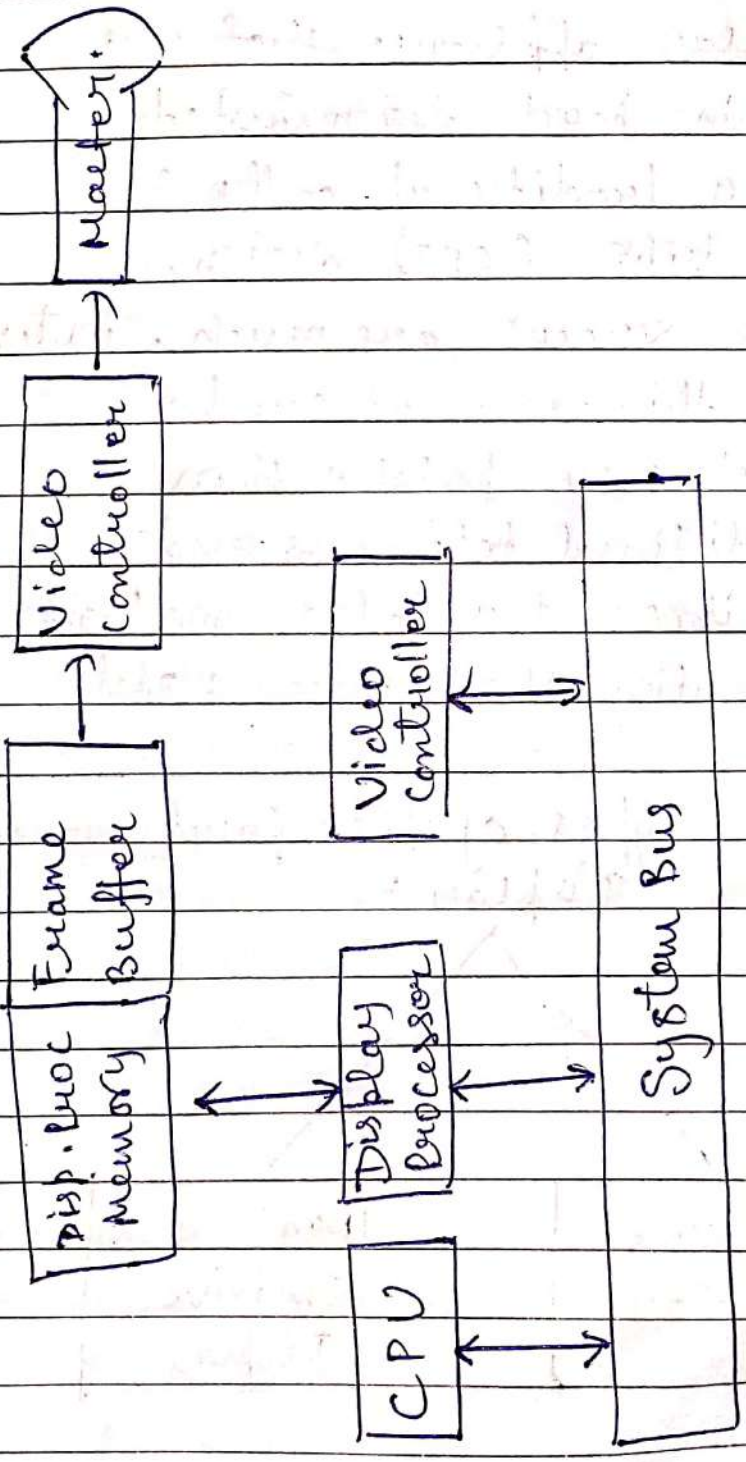
- The lines are scanned from left to right and when a line is finished again the controller moves to the next line and scans the line from left to right & on-

Date / /

Page no.

- After that the image is produced in the Cathode Ray tube.

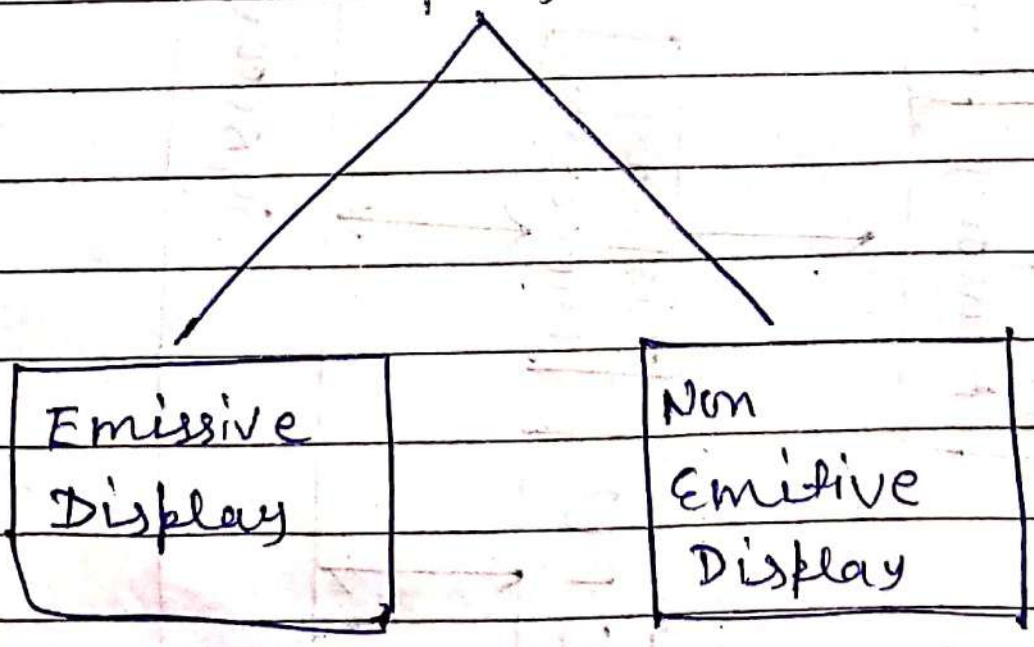
Raster Scan Architecture



Flat Plan displays

A flat panel display is a television, monitor or other display appliance that uses a thin panel design instead of a traditional cathode ray tube (CRT) design. These screens are much lighter and thinner, and can be much more portable than traditional televisions and monitors. They also have higher resolution than older models.

Types of flat Panel Display :-



Ans6 Input Devices

The Input devices are the hardware that is used to transfers input to the Computer.

Different Input Devices

→ keyboard
→ Mouse
→ Trackball
→ Spaceball
→ Light pen
→ Digitizer
→ Touch Panels
→ Voice Recognition
→ Image Scanner

keyboard :-

The most commonly used input device is a keyboard. The data is entered by pressing the set of keys.

Mouse :-

A mouse is a pointing device and used to position the pointer on the screen. It is a small palm size box.

It is Similar to trackball, but it can move in six directions only. The movement is recorded by the Strain gauge. Strain gauge is applied with pressure. One third of the ball is an inside box, the rest is outside.

(5) Joystick

A joystick is also a pointing device which is used to change cursor position on a monitor screen. Joystick is a stick having a spherical ball as it's both lower and upper ends.

Date / /

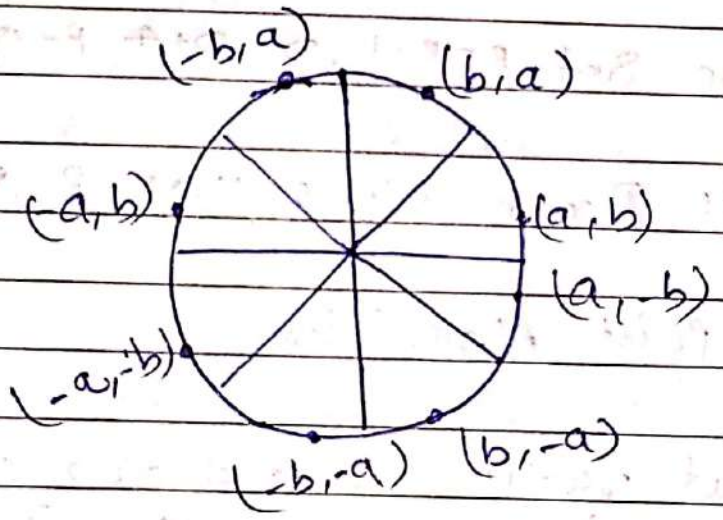
Page no.

Ans 12 Drawing a circle on screen is little complex than drawing a line. There are two algorithms for generating a circle -

(i) Bresenham's Algorithm

(ii) Mid point circle Algorithm

Equation :-



Equation of circle = $x^2 + y^2 = r^2$

r = radius.

Algorithm

Step 1 Get the coordinates of the center of the circle and radius, and store them in x, y and R respectively. Set I = 0 and S = R

Date / / Page no.

Step 2 Set decision parameter $D = 3 - 2R$

Step 3 Repeat through step-8 while $P \leq Q$.

Step 4 Call Draw Circle X, Y, P, Q.

Step 5 Increment the value of P.

Step 6 If $D < 0$ then $D = D + 4P + 6$

Step 7 Else Set $R = R - 1$, $D = D + 4P - Q + 10$

Step 8 Call Draw Circle X, Y, P, Q

Midpoint Algorithm

Step 1 Input radius r and cicle center (x_c, y_c) and obtain the first point on the circumference of the cicle centered on the origin as

$$(x_0, y_0) = (0, r)$$

Step 2 Calculate the initial value of decisim parameter as

$$P_0 = 5/4 - r$$

Date / / Page no.

Step 3 At each x_k position at $k=0$, perform the foll. test -

If $P_k < 0$ then next point on circle $(0,0)$ is (x_{k+1}, y_k) and

$P_{k+1} = P_k + 2x_{k+1} + 1$

Else $P_{k+1} = P_k + 2x_{k+1} + 1 - 2y_{k+1}$

where, $2x_{k+1} = 2x_{k+2}$ and $2y_{k+1} = 2y_{k-2}$

Step 4 Determine the symmetry points other seven octants.

Step 5 Move each calculate pixel position x, y onto the circular path centered on (x_c, y_c) and plot the coordinate values

$x = x + x_c$, $y = y + y_c$

Step 6 Repeat Step-3 through 5 until $x >= y$

Disadvantage

→ Accuracy of the generating points is an issues in this algorithm.

→ This algorithm suffers when used to generate complex and high graphical images.

Date / /

Page no.

Ans 8 Refreshing is needed for maintaing the picture on the screen. Refreshing of screen is done by keeping the phosphorus glowing to redraw the picture repeatedly i.e. by quickly directing the electronic beam back to the same points.

1) A beam of Cathode rays discharged by an Electron gun moves through some deflection systems.

2) So these deflection systems which direct the beam towards a discribed specified position on the screen.

3) This Screen is phosphor coated, and this phosphor discharges a mark of light at each position where it is contacted by the electron beam.

4) Then method we require is "To keep up the phosphor glowing is to draw up again (redraw) the picture repeatedly by quickly directing this electron beam back on to the

DELTA My NoteBook