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Question No 2

Part No 1 :-

In direct colour system :-

RGB  $\Rightarrow R = 8 \text{ bits}, G = 8 \text{ bits}, B = 8 \text{ bits}.$

$\Rightarrow N = 8$

$$2^N = 2^8 = 16,777,216 \text{ colors.}$$

also memory frames.

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$\Rightarrow$  In direct colour system :-

RGB  $\Rightarrow$  R = 5 bits, G = 6 bits,  
B = 5 bits

$N_r = 5$ ,  $N_g = 6$ ,  $N_b = 5$

$\Rightarrow 2^N = 2^{16} = 65,536$  colors  
Preference :-

Reason No 1 :-

More colors than discernable  
by human eye.

Reason No 2 :-

More colors require more  
memory frames.

that why we prefer direct color over  
true colour in common use.

Part No b :-

Given :-

$\Rightarrow$  No of bits used for Red color =  $N_r = 4$  bits.

$\Rightarrow$  No of bits used for Green color =  $N_g = 5$  bits.

$\Rightarrow$  No of bits used for blue color =  $N_B = ?$

We have to find Blue color bits = ?

while total colors = 8192

$$\Rightarrow 2^{(N_r + N_g + N_B)} = 8192$$

$$\Rightarrow 2^{(4+5+N_B)} = 8192 \longrightarrow \textcircled{i}$$

$$\text{As } 2^{13} = 8192 \longrightarrow \textcircled{ii}$$

compare the power of 2 of eq (i) and eq (ii)

$$\Rightarrow 4+5+N_B = 13$$

$$\Rightarrow N_B = 13 - 4 - 5$$

$$\Rightarrow N_B = 4 \text{ bits}$$

So the no of bits for Blue color is 4 bit.

## Question No 3

Part No a :-

Ans :- if we consider only the display (ignoring shaded or lines) than vector display will be faster than Raster display because vector display draw lines directly, no need of predefined grid or buffer, while raster display image using predefined grid of pixels and the images is stored in a frame buffer.  
(Scan 60 time per second)

OR

vector display redraws as quickly as possible given the number of objects on the screen; while CRT based raster displays redraw the images at a fixed rate

(e.g 60 time per second) no matter how complex the scene.

CRT Scanning Speed = 3cm/milli second

Size of display = 10cm x 10cm

outline of square = 6cm (each side)

Approximate display time = ?

Solution :-

As square has 4 sides  
and 1 side is 6cm

$\Rightarrow$  So, 4 sides = 24cm (total)

As, 3cm Scanning take 1 millisecond

total Scanning =  $\frac{24\text{cm}}{3\text{cm}} = 8$  times.

$\Rightarrow$  therefore, total 8 Scanning will  
be occur.

and display time will be :-

$$= 8 \times 10^{-3}$$

$$= 0.008 \text{ seconds}$$

or Total Display time = 8 millisecond.

Part No B :-

Raster display would be better for filled square shape because :-

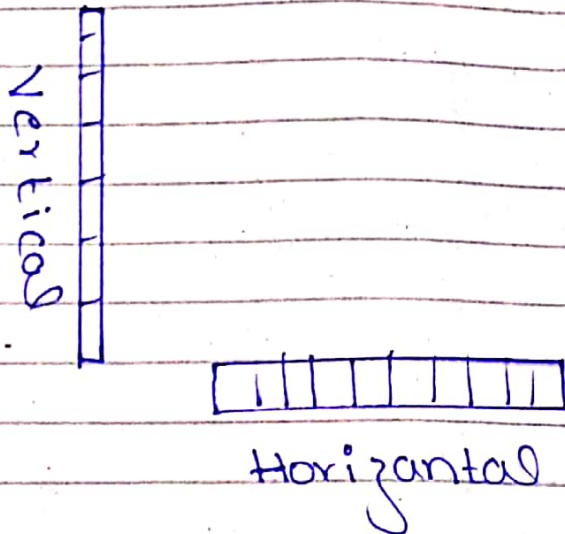
Reason :-

- (i) Advance vector system can provide a limited amount of shading.
- (ii) Refresh vector displays are limited in how many lines or how much text can be shown without refresh flicker.
- (iii) Irregular beam motion is slower than steady beam motion of raster display.
- (iv) it's difficult to use vector display for realistic (shaded) images.

How - ever raster display is cheap and paint entire screen on each scan (use for area filling).

Question No 1

Ans :- On a Black of white display if the pixel is rectangular in shape with height of pixel " $3x$ " of width is " $x$ " then according to the given situation the line can be drawn as follow :



The vertical line will be the thinnest possible line as compared to Horizontal line. As the vertical line travels on  $y$ -axis of its width is ' $x$ ' where horizontal line travel on  $x$ -axis of its height is ' $3x$ ' which is more than width.