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1st Periodical Test

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Write NA for question not attempted		NA		NA	

Sharmishtha
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Ques 1)

Ans 1) a) A higher refresh rate refer to the frequency that a display updates the onscreen image. The time between these updates is measured in milliseconds (ms) while the refresh rate of the display is measured in Hertz (Hz).

The refresh rate of the display determines how many times per second the display is able to draw a new image. for eg - if your display has a refresh rate of 144 Hz it is refreshing the image 144 times per second. When paired with the high frame rates produced by a GPU and CPU working together, this can result in a smoother experience and potentially higher FPS.

Ans 1) b) 8-plane frame buffer
640 x 480 resolutions.
Depends on the precision of the buffer. After that the maths to work it out is trivial.

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$8 \times 640 \times 480 = 2457600$ pixels

2457600×8 bits per pixel

$= 19660800$ bits or

$= 2457600$ bytes or

$= 2.4576$ MB

If we have a 64 bits floating-point buffer in that case 2457600×64 bits per pixel $= 157286400$ bits or

$= 19660800$ bytes or

$= 19.6608$ MB.

Ans 1) c) Raster scan display produces more realistic display than random scan display, as Raster scan display is based on intensity control of pixels in the form of a rectangular of on and off pixels is stored in refreal buffer or frame buffer. The rastar scan can store information of each pixel position, so its suitable for realistic display of objects. Raster scan provides a refresh rate of 60 to 80 frames per second. eg → Television.

Random scan display have high resolution than the Rastar scan

scan displays. As Random scam septum used an electron beam which operates like a pencil to create a line image on the CRT screen. The picture is constructed out of a sequence of straight line segments. Each line segment is drawn on the screen by directing the beam to move from one point on screen to the next, where its x and y coordinates define each point. After drawing the picture, the septum cycles back to the first line and design all the lines of the image 30 to 60 times each second.

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Ques 3) Given,

Starting coordinate = $(X_0, Y_0) = (11, 12)$
Ending coordinate = $(X_n, Y_n) = (20, 16)$

Step 1 →
Calculate Δx and Δy from given i/p →

$\Delta x = X_n - X_0 = 20 - 11 = 9$
$\Delta y = Y_n - Y_0 = 16 - 12 = 4$

Step 2 →
Calculate decision parameter

$P_K = 2\Delta Y - \Delta X$
$P_K = 2(4) - 9$
$P_K = -1$

Step 3 →
Suppose the current pair is (X_K, Y_K) and next point is (X_{K+1}, Y_{K+1}), find next point depending on value of decision parameter P_K.

→ Follow the 2 cases →

2 cases:

- **Case 1** ($P_K < 0$) → $P_{K+1} = P_K + 2\Delta Y$
  $X_K = X_{K+1}$
  $Y_{K+1} = Y_K$
- **Case 2** ($P_K \geq 0$) → $P_{K+1} = P_K + 2\Delta y - 2\Delta x$
  $X_{K+1} = X_K + 1$
  $Y_{K+1} = Y_K + 1$

as $P_K < 0$, so case 1 is satisfied.
Thus,

$P_{K+1} = P_K + 2\Delta Y$

$P_{K+1} = -1 + 2(4)$

$P_{K+1} = 7$

$X_{K+1} = X_K + 1 = 11 + 1 = 12$

$Y_{K+1} = Y_K + 1 = 12$

Similarily step 3 is executed until the end point is reached or no. of iterations equals to $\Delta x - 1 = 9 - 1 = 8$ times

Ans 3b) Run length encoding stores cells on a row-by-row basis. Instead of recording each individual cells value, run-length encoding groups cells values by row.

Take this line of data →
AAAAAA BBBB CCCCCCCCC

It can be rendered as:
6A4B9C

This image encoding method reduces data volumes because each line is recorded more efficiently. Even

though the same information is being held, values that are the same are stored as a string.

Ques 5)

Ans 5) Sometimes we want to fill in or recolor an area that is not defined within a single color boundary.

We can print areas by replacing a specified interior color instead of searching for a boundary color value. This approach is called flood fill algorithm.

We start from a specified interior points (x, y) and re-assign all pixel values that are currently set to a given interior color with the desired fill color. If the area we want to paint has more than one interior color, we can first reassign pixel values so that all interior points have the same color. Using either a 4-connected

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or 8-connected approach, we then step through pixel point positions until all interior points have been repainted.

The following procedure flood fills a 4-connected region recursively, starting from the input position.

```
void floodfill (int x, int y, int fillcolor,
                int oldcolor)
{
    if (getPixel (x,y) == oldcolor)
    {
        setcolor (fillcolor);
        setPixel (x, y);
        floodfill4(x+1, y, fillcolor, oldcolor);
        floodfill4(x-1, y, fillcolor, oldcolor);
        floodfill4 (x, y+1, fillcolor, oldcolor);
        floodfill4 (x, y-1, fillcolor, oldcolor);
    }
}
```

Diagram →

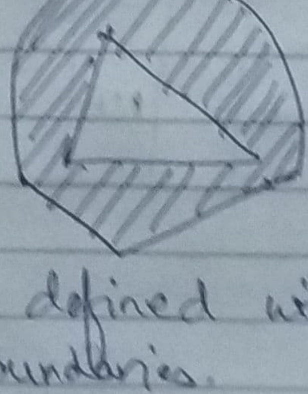

fig: An area defined within multiple color boundaries.

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