Computer Graphics

3911037S

CAE-1

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PART-B

⑥ $(x_1, y_1) = (5, 5)$

$(x_2, y_2) = (12, 10)$

$dx = 5 - 12 = \boxed{-6} = dx$

$dy = 10 - 5 = \boxed{5} = dy$

$P = 2 \times 5 - (-6)$

$= 10 + 6 =$

$\boxed{P = 16}$

$twoDy = 2 * dy = 2 \times 5 = \boxed{10} = twoDy$

$twoDyDx = 2 \times (dy - dx) = 2[5 - (-6)]$

$= 2(11)5$

~~twoDx = 22~~ | $\boxed{twoDyDx = 22}$

$x = 5$

$y = 5$

$xEnd = 12$

setPixel(5, 5)

while loop

```
while (x < xEnd)
    x++;
    if P < 0
        p = twoDy
    else
        y++
        p = twoDx
    setPixel(x, y)
```

```
if (xa > xb)
    x = xb
    y = xa
    xEnd = ya;
else
    x = xa
    y = ya
    xEnd = xb;
```

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k	p_k	(x_{k+1}, y_{k+1})
0	38	(6,6)
1	60	(7,7)
2	82	(8,8)
3	104	(9,9)
4	126	(10,10)
5	148	(11,11)
6	170	(12,12)

while(x < xEnd)
x++
if (p<0)
p += twoDy
else
y++
p += twoDyDx
setPixel(x, y)
end while

x = 6 7 8 9 10 11 12

y = 6 7 8 9 10 11 12

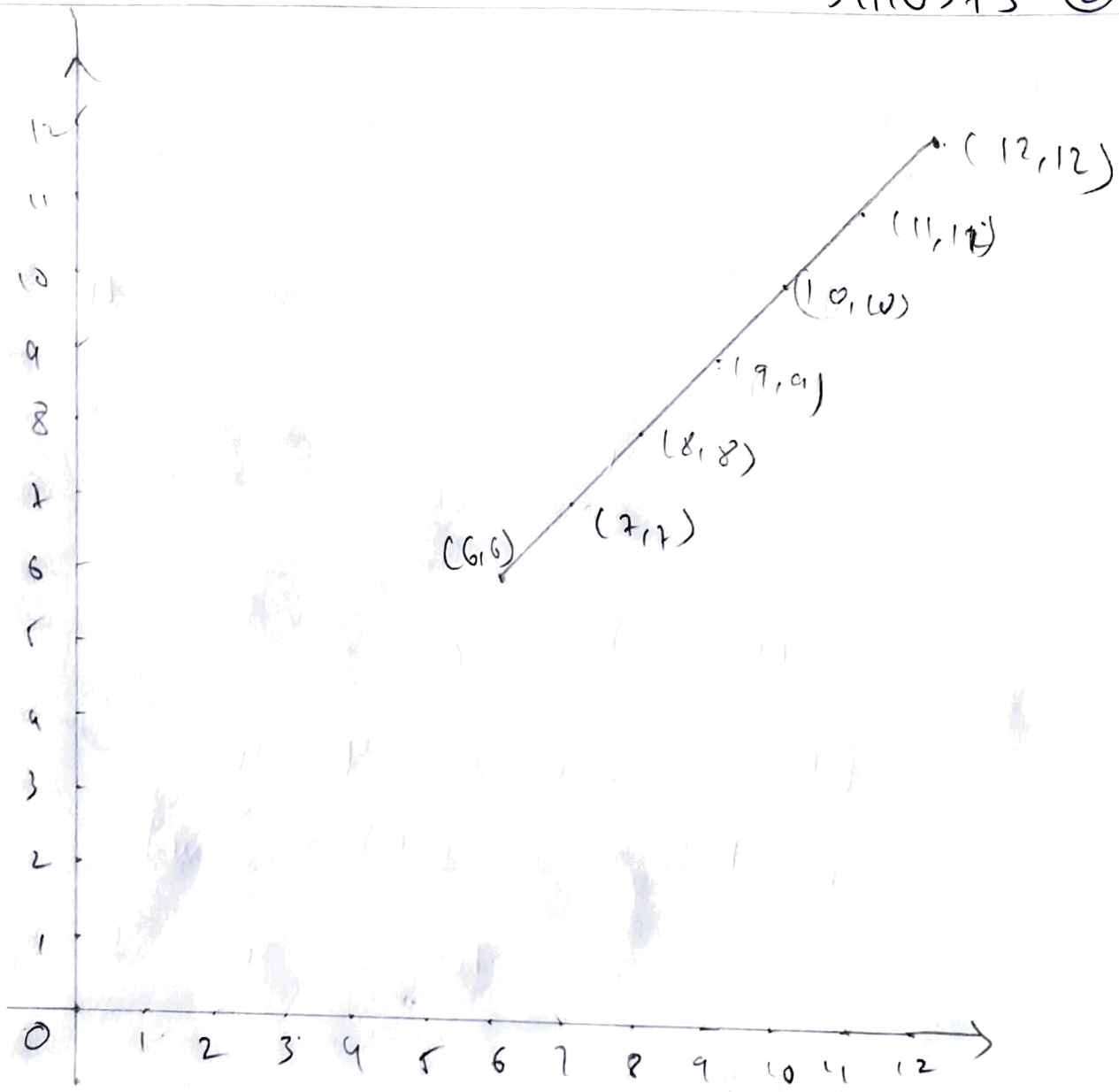
p:

p = 16 p = 16 38 60 82 104 126 148 170

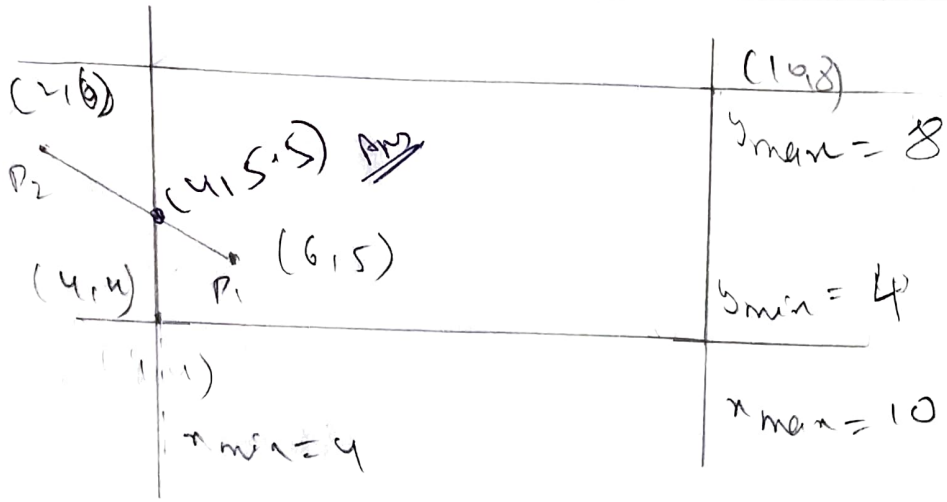
twoDy = 10

twoDyDx = 22

39110373 ②


12
11
10
9
8
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7 8 9 10 11 12
(6,6)
(7,7)
(8,8)
(9,9)
(10,10)
(11,11)
(12,12)

(9)



for $P_1(\underset{x}{6}, \underset{y}{5})$

Bit 1: $x - x_{min} = 6 - 4 = 4$

Bit 1 is 0 (∵ 4 is +ve)

Bit 2: $x_{max} - x = 10 - 6 = 4$

Bit 2 → 0

Bit 3: $y - y_{min} = 5 - 4 = 1$

Bit 3 → 0

Bit 4: $y_{max} - y = 8 - 5 = 3$

Bit 4 → 0

So, region code P1 = 0000

⇒ P1 is inside the clip window

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for $P_2(2,6)$

Bit 1: $x - x_{min} = 2 - 4$

$= -2$

Bit 1 → 1 (∵ −ve)

Bit 2: $x_{max} - x = 10 - 2 = 8$

Bit 2 → 0

Bit 3: $y - y_{min} = 6 - 4 = 2$

Bit 3 → 0

Bit 4: $y_{max} - y = 8 - 6 = 2$

Bit 4 → 0

So, region code of P2 = 1000

→ P2 is in the top of clipping window

P1: 0000

P2: 1000

$m = \frac{6-5}{2-6} \Rightarrow m = \frac{-1}{4}$

Case 1: bit = 1

$y_3 = y_1 + m(x - x_1)$ ($x \to x_{min}$)

$y_3 = 5 - \frac{1}{4}(4-6) \Rightarrow y_3 = 5 - \frac{1}{4}(-2)$

$$y_3 = 5 + \frac{1}{2} = \frac{10+1}{2}$$

$$y_3 = \frac{11}{2} \Rightarrow \boxed{y_3 = 5.5}$$

∴ Intersecting point is (4, 5.5)

PART-A

(5) ~~Intro~~ ~~what~~

(i) True-color is the specification of the color of a pixel on a display screen ~~that~~ which uses a 24-bit value.

(2) The following are the types I/P device

(i) Keyboard
(ii) Mouse
(iii) Trackball
(viii) Touch Panels.
(iv) Spaceball
(v) Joystick
(vi) Light-Pen
(vii) Digitizer.

(3) $(x_a, y_a) = (10, 15)$

$(x_b, y_b) = (20, 18)$

$dx = x_b - x_a = 20 - 10$

$\boxed{dx = 10}$

$dy = y_b - y_a = 18 - 15 = 3$

$\boxed{dy = 3}$

$steps = dx = 10$

$x_{increament} = \frac{dx}{steps} = \frac{10}{10} = 1$

$\boxed{x_{increament} = 1}$

$y_{increament} = \frac{dy}{steps} = \frac{3}{10} = .$

$\boxed{y_{increament} = 0.3}$

(4) Step1: Translate window to origin

$P_x = -x_{wmin}$

$P_y = -y_{wmin}$

Step2: Scaling of the window to match it's size to the viewport

Step3: Again translate viewport to its correct position on screen.

(2) Types of Clipping Algorithm's

(i) Point Clipping
(ii) Line Clipping
(iii) Area Clipping
(iv) Curve Clipping
(v) Text Clipping
(vi) Exterior Clipping.