

## Section: PC-D

Ⓐ Write down the Algorithm of Bresenham Line Drawing.

Step 1: Initialize starting coordinates  $(x_1, y_1)$  and ending coordinates  $(x_2, y_2)$ .

Step 2: Then calculate  $dx$  and  $dy$  from given input.

$$\therefore dy = y_2 - y_1$$

$$dx = x_2 - x_1$$

Step 3: Calculate the decision parameter  $P_k$ .

It is calculated as -

$$P_k = 2dy - dx$$

Step 4: Assume that, the current point is

$(x_k, y_k)$  and the next point is  $(x_{k+1}, y_{k+1})$ .

Find the next point depending on the value of decision parameter  $P_k$ .

It depends on following two cases -

Case-1: If  $P_k < 0$  then,

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

$$x_{k+1} = x_k + 1$$

$$y_{k+1} = y_k$$

Case-2:

If  $P_k \geq 0$  then

$$P_{k+1} = P_k + 2dy - 2dx$$

$$x_{k+1} = x_k + 1$$

$$y_{k+1} = y_k + 1$$

Step-5:

Keep doing it step-03 until the end point is reached or number of iterations equals to  $(dx-1)$  times.