UNIT I

Scan Conversion

2

Multiple Choice Questions for Online Exam

Q. 1 Expansion of line DDA algorithm is
(a) Digital difference analyzer
(b) Direct differential analyzer
(c) Digital differential analyzer
(d) Data differential analyzer **Ans. : (c)**
Explanation : DDA stands for digital differential analyzer.

Q. 2 Which algorithm is a faster method for calculating pixel positions?
(a) Bresenham's line algorithm
(b) Parallel line algorithm
(c) Mid-point algorithm
(d) DDA line algorithm **Ans. : (d)**
Explanation : The DDA is a faster method for calculating pixel positions.

Q. 3 The disadvantage of line DDA is
(a) Time consuming (b) Faster
(c) Neither a nor b (d) None of the mentioned **Ans. : (a)**
Explanation : The DDA algorithm takes more time than other algorithm.

Q. 4 An accurate and efficient raster line-generating algorithm is
(a) DDA algorithm
(b) Mid-point algorithm
(c) Parallel line algorithm
(d) Bresenham's line algorithm **Ans. : (d)**
Explanation : Bresenham's line algorithm is a very efficient and accurate algorithm.

Q. 5 In Bresenham's line algorithm, if the distances d1 < d2 then decision parameter Pk is_____
(a) Positive
(b) Equal
(c) Negative
(d) Option a or c **Ans. : (c)**
Explanation : If d1 < d2 then the decision variable is always negative.

Q. 6 _____ is a command in C language to display a particular point on screen.
(a) setpixel (b) putpixel
(c) getpixel (d) drawpixel
Ans. : (b)
Explanation : Putpixel is a command in C language to display a particular point on screen. Setpixel is not a command at all. getpixel is used to read the color of the pixel.

Q. 7 The equation of a line in parametric form is _____.
(a) $Y = M.X + B$
(b) $Y = M.X$
(c) $(y - y1) / (x - x1) = (y2 - y1) / (x2 - x1)$
(d) $x = x1 + (x2 - x1)u$
Ans. : (d)
Explanation : The equation of line in parametric form is $x = x1 + (x2 - x1)\,u$.

Q. 8 The intersection point of two lines is given by _____.
(a) $x1 = (b2 - b1)/(m1 - m2)$,
$y1 = (m1b2 - m2b1) / (m1 - m2)$
(b) $x1 = (b1 - b2)/(m1 - m2)$,
$y1 = (m2b2 - m1b1) / (m1 - m2)$
(c) $x1 = (b2 - b1)/(m2 - m1)$,
$y1 = (m1b2 - m2b1) / (m2 - m1)$
(d) $x1 = (b2 - b1)/(m2 - m1)$,
$y1 = (m1b2 - m2b1) / (m2 - m1)$
Ans. : (a)
Explanation : The intersection point of two lines is given by $x1 = (b2 - b1)/(m1 - m2)$, $y1 = (m1b2 - m2b1) / (m1 - m2)$

Q. 9 The long form of DDA is _____.
(a) Digital Differential Analysis
(b) Differential Digital Analyzers
(c) Digital Differential Analyzers
(d) Digital Differential Anomaly
Ans. : (c)
Explanation : The long form of DDA is Digital Differential Analyzers

Q. 10 In line generation algorithm, if |Dx| < |Dy| and Ya < Yb then increments in X and Y are _____ respectively
(a) 1,M (b) (–1,–M) (c) (1/M,1) (d) (–1/M,–1)
Ans. : (c)
Explanation : In line generation algorithm, if |Dx| < |Dy| and Ya < Yb then increments in X and Y are (1/M,1) respectively because there are more number of rows than the columns so we have to increase rows by 1 and for that row we have to find column by slope 1/M.

Q. 11 In line generation algorithm, if |Dx| < |Dy| and Ya > Yb then increments in X and Y are _____ respectively
(a) 1,M (b) (–1,–M)
(c) (1/M,1) (d) (–1/M,–1)
Ans. : (d)

Explanation : In line generation algorithm, if |Dx| < |Dy| and Ya > Yb then increments in X and Y are (–1/M,–1) respectively because there are more number of rows than the columns and starting Y coordinate is greater than ending Y coordinate, so we have to decrease column by 1 and for that column we have to find row by slope (–1/M).

Q. 12 In supersampling antialiasing technique each pixel is subdivided into ___ subpixels

(a) 4 (b) 8 (c) 9 (d) 10

Ans. : (c)

Explanation : In supersampling antialiasing technique each pixel is subdivided into 9 subpixels.

Q. 13 Which character generation method allows to change the font size of character?

(a) Stroke method (b) Dot Matrix method
(c) Starbust Method (d) None of these

Ans. : (a)

Explanation : Stroke method allows to change the font size of characters because we can select different length of line segment to draw the different characters.

Q. 14 If the line is from A(0,0) and B(4,6), then the slope will be _____.

(a) 1 (b) 1.5 (c) 0.66 (d) 2

Ans. : (b)

Explanation : Dx = x2 – x1 = 4, Dy = y2 – y1 = 6 , So Dy/Dx = 6/4 = 1.5

Q. 15 How many pixels will be there in the line segment with the end points A(0,0) and B(4,6)?

(a) 6 (b) 7 (c) 8 (d) 5

Ans. : (b)

Explanation : Since the end points are A(0,0) and B(4,6), Dx < Dy. So we have to move along Y direction from Y = 0 to Y = 6. So there will be 7 pixels.

Q. 16 A point P(1,3) is on circle that has centre at the origin. which of the following point is not on the circle?

(a) (1,–3) (b) (–1,–3) (c) (–3,–1) (d) None of these

Ans. : (d)

Explanation : All the three points are on the circle.

Q. 17 Which of the following is not true w.r.t. DDA line drawing algorithm ?

(a) Use floating point arithmetic
(b) Because of floor and ceil function error component is introduced.
(c) Faster than Bresenham line algorithm
(d) Use of multiplication and division operations

Ans. : (c)

Explanation : DDA algorithms are slower than Bresenham algorithm because DDA deals with floating point arithmetic and Bresenham deals with only integers. As floating point arithmetic is slower than integer artithmetic, DDA algorithms are slower than Bresenham.

Q. 18 Which of the following is not true w.r.t. Bresenham line drawing algorithm ?

(a) Error component is introduced.
(b) Use of only Addition and Subtraction operations.
(c) Use only integers.
(d) Faster than DDA

Ans. : (a)

Explanation : There is no error component introduced in Bresenham algorithm.

Q. 19 The lines whose slopes are in between – 1 to 1 are called as _____ lines.

(a) Gentle slope (b) Steep Slope
(c) Sharp slope (d) None of these

Ans. : (a)

Explanation : The lines whose slopes are in between – 1 to 1 are called as Gentle slope lines whereas slope other than – 1 to 1 are called as steep or sharp slope.

Q. 20 The lines whose DY > DX are called as _____ lines

(a) Gentle slope (b) Steep Slope
(c) Vectors (d) None of these

Ans. : (b)

Explanation : The lines whose DY > DX are called as Steep slope lines because change in Y is more than change in X means there are more number of rows (Y-coordinates) as compared to columns (X coordinates).

Q. 21 In DDA line drawing algorithm for a gentle slope line we have to move along _____ and calculate _____.

(a) X, Y = Y + slope (b) X, Y = Y + (1/slope)
(c) Y, X = X + slope (d) Y, X = X – (1/slope)

Ans. : (a)

Explanation : In DDA line drawing algorithm for a gentle slope line we have to move along __X__ and calculate __ Y = Y+ slope___ because in gentle slope there are more number of columns (X coordinates) as compared to number of rows (Y coordinates)

Q. 22 In DDA line drawing algorithm for a steep slope line we have to move along _____ and calculate _____.

(s) X, Y = Y + slope (b) X, Y = Y + (1/slope)
(c) Y, X = X + slope (d) Y, X = X + (1/slope)

Ans. : (c)

Explanation : In DDA line drawing algorithm for a Steep slope line we have to move along __Y__ and calculate __X = X + (1/slope)___ because in steep slope there are less number of columns (X coordinates) as compared to number of rows (Y coordinates).

Q. 23 "Ceil" function is used in ____ line drawing method

(a) DDA (b) Bresenham
(c) Midpoint (d) Increment

Ans. : (a)

Explanation : Ceil and floor methods are used in DDA algorithm.

Q. 24 Which of the following is not true with respect to DDA line drawing algorithm ?

(a) Deals with floating point numbers
(b) Error is introduced in the calculated point
(c) It is faster i.e. less time consuming
(d) Easy to understand

Ans. : (c)

Q. 37 Different character styles can be generated by using _____.

(a) Stroke Method (b) Starbust Method
(c) Dot Matrix Method (d) Bit map method

Ans. : (a)

Explanation : Different character styles can be generated by using stroke method because we can change the length of the line segment and ultimately change the font size of the character.

Q. 38 A _____ uses a rectangular pattern of pixels to define each character

(a) Stroke Method (b) Starbust Method
(c) Bit map method (d) None of these

Ans. : (c)

Explanation : A Bit map method uses a rectangular pattern of pixels to define each character the rectangular pattern could be 5×9, 7×9 or 9×13.

Q. 39 To convert screen coordinates into normalized coordinates we have to use _____.

(a) X = (X – Heightstart) / Height,
Y = (Y – Widthstart) / Width
(b) X = (X – Widthstart) / Width,
Y = (Y – Heightstart) / Height
(c) X = (X · Width) + widthstart,
Y = (Y · Height) + Heightstart
(d) X = (X · Height) + Heightstart,
Y = (Y · Width) + widthstart

Ans. : (b)

Explanation : To convert screen coordinates into normalized coordinates we have to use X = (X – Widthstart) / Width, Y = (Y – Heightstart) / Height and to convert normalized coordinates into screen coordinates we have to use X = (X · Width) + widthstart, Y = (Y · Height) + Heightstart

Q. 40 To convert normalized coordinates into screen coordinates we have to use _____.

(a) X = (X – Heightstart) / Height,
Y = (Y – Widthstart) / Width
(b) X = (X – Widthstart) / Width,
Y = (Y – Heightstart) / Height
(c) X = (X · Width) + widthstart,
Y = (Y · Height) + Heightstart
(d) X = (X · Height) + Heightstart,
Y = (Y · Width) + widthstart

Ans. : (c)

Explanation : To convert normalized coordinates into screen coordinates we have to use
X = (X · Width) + widthstart,
Y = (Y · Height) + Heightstart and to convert screen coordinates into normalized coordinates we have to use
X = (X – Widthstart) / Width, Y = (Y – Heightstart) / Height

Q. 41 If the line having A(5,3) and B(1,1), then the slope is _____.

(a) 4 (b) 2 (c) 1 (d) 0.5

Ans. : (d)

Explanation : Dx = x2 – x1 = 4, Dy = y2 – y1 = 2 , Sice slope = change in Y / change in X i.e. Dy/Dx = 2/4 = 0.5

Q. 42 Which of the following are the problems of Aliasing?

(a) staircase (b) picket fence
(c) unequal Brightness (d) All of these

Ans. : (d)

Explanation : Aliasing is nothing but any kind of distortion. Staircase, Picket fence and unequal brightness are all the problems of aliasing only.

Q. 43 In mid point circle drawing algorithm the initial value of decision making parameter is _____.

(a) (3 – 2r) (b) (r)
(c) (r –1) (d) ((5/4) – r)

Ans. : (d)

Explanation : In mid point circle drawing algorithm the initial value of decision making parameter is ((5/4) – r) and for bresenham circle drawing it is 3 – 2r.

Q. 44 In Bresenham circle drawing algorithm the initial value of decision making parameter is _____.

(a) (3 – 2r) (b) (r)
(c) (r – 1) (d) ((5/4) – r)

Ans. : (a)

Explanation : In mid point circle drawing algorithm the initial value of decision making parameter is (3 – 2r) and for midpoint circle drawing it is ((5/4) – r).

Q. 45 For ellipse drawing, if f(x,y) > 0 then _____.

(a) then x, y is inside the ellipse boundary
(b) then x, y is on ellipse boundary
(c) then x, y is outside the ellipse boundary
(d) None of these

Ans. : (c)

Explanation : For ellipse drawing, if f(x,y) > 0 then (x, y) is outside the ellipse boundary. If f(x, y) < 0 then (x, y) is inside the ellipse boundary and the point will be exactly lying on boundary of the ellipse if the equation is equal to 0.

Q. 46 The various forms of distortions are called as _____.

(a) Antialiasing (b) Aliasing
(c) filtering techniques (d) None of these

Ans. : (b)

Explanation : The term aliasing is used for the various forms of distortions. Antialiasing is group of techniques to avoid the aliasing effects.

Q. 47 For staircase problem, _____ antialiasing technique is used.

(a) Pixel Phasing (b) Postfiltering
(c) Supersampling (d) Gray level

Ans. : (d)

Explanation : Gray level technique is used for reduction of effects generated by staircase problem. Whereas pixel phasing is a hardware antialiasing technique.

Q. 48 _____ is a hardware based antialiasing technique.

(a) Pixel Phasing (b) Postfiltering
(c) Supersampling (d) Gray level

Ans. : (a)

Explanation : Pixel phasing is a hardware based antialiasing technique whereas Gray level technique is used for reduction of effects generated by staircase problem.

Explanation : Resolution is 640 x 480, and Xn = 0.2 and Yn = 0.2, then Xs = (640 · 0.2) = 128;
Ys = (480 · 0.2) = 96.

Q. 62 In parametric polar form if the radius of the circle is 'r', then the X point on circumference will be _____.

(a) X= r·(cos θ) (b) X= r·(tan θ)
(c) X= r·(sin θ) (d) None of these

Ans. : (a)

Explanation : In parametric polar form if the radius of the circle is 'r', then the X point on circumference will be X = r·(cos θ), Y= r·(sin θ) because in parametric polar form we have to use trigonometric functions to find X and Y on the circumference of the circle.

Q. 63 Which of the following is not the equation of the line ?

(a) Y = M.X + B
(b) (y – y1)(x – x1) = (y2 – y1)(x2 – x1)
(c) (y – y1) / (x – x1) = (y2 – y1) / (x2 – x1)
(d) x = x1 + (x2 – x1)u

Ans. : (b)

Explanation : (y – y1)(x – x1) = (y2 – y1)(x2 – x1) is not equation of the line. All others are the forms of equation of the line.

Q. 64 In _____ antialiasing technique every subpixel is having equal weightage.

(a) Prefilteing (b) Postfiltering
(c) Supersampling (d) Pixel phasing

Ans. : (c)

Explanation : In supersampling antialiasing technique every subpixel is having equal weightage whereas in Postfiltering antialiasing technique the central subpixel is having 50%.

Q. 65 In DDA line drawing algorithm, "floor" function for a 2.4 will be _____.

(a) 2 (b) 3 (c) 2.5 (d) None of these

Ans. : (a)

Explanation : This is a function which returns largest integer which is less than or equal to its argument.

Q. 66 In _____ algorithm calculated point and displayed points are different.

(a) Bresenham line drawing (b) DDA line drawing
(c) Increment method (d) Midpoint method

Ans. : (b)

Explanation : Because of rounding off, In DDA line drawing algorithm calculated point and displayed points are different.

Q. 67 In bresenham line drawing algorithm, the decision making parameters initial value is _____.

(a) G = (2· Dy) – Dx. (b) G = (2· Dx) – Dy.
(c) G = 2·(Dx – Dy). (d) G = 2· (Dy – Dx)

Ans. : (a)

Explanation : In bresenham line drawing algorithm, the decision making parameters initial value is
G = (2· Dy) – Dx

Q. 68 In bresenham line drawing algorithm, if the row is changed then we need to update the decision making parameter as _____.

(a) G = G + (2 · Dy) – (Dx)
(b) G = G + (2 · Dx) – (Dy)
(c) G = G + (2 · Dy) – (2 · Dx)
(d) G = G + (2 · Dx) – (2 · Dy)

Ans. : (c)

Explanation : In bresenham line drawing algorithm, if the row is changed then we need to update the decision making parameter as G = G + (2 · Dy) – (2 · Dx) and if the row is not changed then we need to update the decision making parameters as G = G + (2 · Dy) – (Dx).

Q. 69 In bresenham line drawing algorithm, if the row is not changed then we need to update the decision making parameter as _____.

(a) G = G + (2 · Dx) – (Dy)
(b) G = G + (2 · Dy) – (Dx)
(c) G = G + (2 · Dy) – (2 · Dx)
(d) G = G + (2 · Dx) – (2 · Dy)

Ans. : (b)

Explanation : In bresenham line drawing algorithm, if the row is not changed then we need to update the decision making parameter as G = G + (2 · Dy) – (Dx) and if the row is changed then we need to update the decision making parameter as G = G + (2 · Dy) – (2 · Dx).

Q. 70 In Midpoint circle drawing algorithm, if the row is changed then we need to update the decision making parameter as _____.

(a) P = P + 2 · (y – x) (b) P = P + 2 · (x – y) + 1
(c) P = P + 2 · (x) + 1 (d) P = P + 2 · (x)

Ans. : (b)

Explanation : In Midpoint circle drawing algorithm, if the row is changed then we need to update the decision making parameter as P = P + 2 · (x – y) + 1 and if the row is not changed then we need to update the decision making parameter as P = P + 2 · (x) + 1.

Q. 71 In Midpoint circle drawing algorithm, if the row is not changed then we need to update the decision making parameter as _____.

(a) P = P + 2 · (y – x) (b) P = P + 2 · (x – y) + 1
(c) P = P + 2 · (x) + 1 (d) P = P + 2 · (x)

Ans. : (c)

Explanation : In Midpoint circle drawing algorithm, if the row is not changed then we need to update the decision making parameter as P = P + 2 · (x) + 1 and if the row is changed then we need to update the decision making parameter as P = P + 2 · (x – y) + 1.

Q. 72 Which of the following is the basic attribute of a character?

(a) Font (b) Size and color
(c) Orientation (d) All of the mentioned **Ans. : (d)**

Explanation : Font, size, color and orientation are the basic attribute of a character.