*Total No. of Questions: 6* *Total No. of Printed Pages:3*

**Enrollment No.....**

Faculty of Engineering

End Sem (Even) Examination May-2022

CS3CO24 / IT3CO25

Computer Graphics & Multimedia

Programme: B.Tech. Branch/Specialisation: CSE / IT

**Duration: 3 Hrs.** **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. Calculate the number of steps between the starting point (5, 6) and ending point (8, 12) using DDA algorithm. **1**

(a) 7 (b) 6 (c) 3 (d) 4

ii. The algorithm used for filling the interior of a polygon is called- **1**

(a) Flood fill algorithm

(b) Boundary fill algorithm

(c) Scan line polygon fill algorithm

(d) None of these

iii. If a point (x, y) is reflected about an axis which is normal to the XY plane and passing through the origin, the reflected point (X, Y) is- **1**

(a) (x, -y) (b) (-x, y) (c) (-x, -y) (d) (y, x)

iv. The left (L bit) bit of the region code of a point (X, Y) is '1' If ..... **1**

(a) X > XWMIN (b) X< XWMIN

(c) X< XWMAX (d) X>XWMAX

v. Bezier spline always passes through- **1**

(a) First and second control point

(b) Does not pass from First and second control point

(c) Both (a) and (b)

(d) None of these

vi. The point at which a set of projected parallel lines appear to converge in called as: **1**

(a) Convergence point (b) Vanishing point

(c) Point of illusion (d) Point of delusion

P.T.O.

vii. Which of the following file extensions would be used for a Quick Time movie? **1**
(a) AVI (b) MPG (c) MOV (d) SGI

viii. Moving Picture Experts Group (MPEG) is used to compress- **1**
(a) Frames (b) Images (c) Audio (d) Video

xi. Which file creates a perfect reproduction of the original images? **1**
(a) Shockwave (b) Nx View
(c) JPG (d) GIF

x. Which image files is a lossy format? **1**
(a) GIF (b) MPEG (c) JPEG (d) PNG

Q.2 i. Explain the following: **2**
(a) Aspect Ratio (b) Flicking
(c) Frame buffer (d) Pixel Persistence

ii. Explain DDA line drawing algorithm with suitable example. **3**

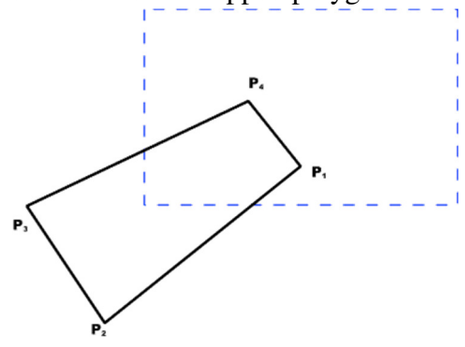
iii. Consider the line from (5, 5) to (13, 9). Use the Bresenham's algorithm to rasterize the line. **5**

OR iv. Given the centre point coordinates (4, -4) and radius as 10, generate all the points to form a circle. use mid-point circle algorithm. **5**

Q.3 i. Perform a 45 degree rotation of a square having vertices A(0,0), B(0,2), C(2.0), and D(2,2) about the origin. **4**

ii. Illustrate the working of Cohen Sutherland line clipping algorithm and apply the algorithm to clip the following lines P1P2 and P3P4 where P1(140,45) P2= (100,60) and window size is given by (30,40,120,90) **6**

OR iii. Consider a polygon with vertices P1P2P3P4. Apply Sutherland Hodgman algorithm to find the clipped polygon. **6**






Q.4 i. Explain HSV color model. **3**

ii. Given a rectangular parallelepiped which is unit distance on z-axis, 2-distance on x-axis and 3-distance on y-axis. Calculate the effect of scaling when scaling factor $S_x$= 1/2, $S_y$= 1/3 and $S_z$= 1? **7**

OR iii. Differentiate following: **7**
(a) Diffuse & Specular reflection. (b) Gouraud & Phone Shading

Q.5 i. What is multimedia? Explain the types & applications of multimedia. **4**

ii. What are the components of digital audio system? Explain the features of digital audio processing software. **6**

OR iii. Write short notes on following: **6**
(a) JPEG (b) MIDI (c) AVI (d) WMV

Q.6 Attempt any two:

i. What is animation? Discuss the principles of animation. Write various application of animation. **5**

ii. Define Multimedia Databases? Also elaborate the layers of Multimedia Architecture? **5**

iii. Explain the basics of Audio compression. List some basic audio compression techniques and standards. **5**

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# Marking Scheme
## CS3CO24 / IT3CO25 Computer Graphics & Multimedia

| | | | | |
|---|---|---|---|---|
| Q.1 | i. | Calculate the number of steps between the starting point (5, 6) and ending point (8, 12) using DDA algorithm.<br>(b) 6 | | **1** |
| | ii. | The algorithm used for filling the interior of a polygon is called-<br>(a) Flood fill algorithm | | **1** |
| | iii. | If a point (x, y) is reflected about an axis which is normal to the XY plane and passing through the origin, the reflected point (X, Y) is-<br>(c) (-x, -y) | | **1** |
| | iv. | The left (L bit) bit of the region code of a point (X, Y) is '1' If .....<br>(b) X< XWMIN | | **1** |
| | v. | Bezier spline always passes through-<br>(a) First and second control point | | **1** |
| | vi. | The point at which a set of projected parallel lines appear to converge in called as:<br>(b) Vanishing point | | **1** |
| | vii. | Which of the following file extensions would be used for a Quick Time movie?<br>(c) MOV | | **1** |
| | viii. | Moving Picture Experts Group (MPEG) is used to compress-<br>(d) Video | | **1** |
| | xi. | Which file creates a perfect reproduction of the original images?<br>(d) GIF | | **1** |
| | x. | Which image files is a lossy format?<br>(c) JPEG | | **1** |
| Q.2 | i. | Explain the following: 0.5 mark for each<br>(a) Aspect Ratio (b) Flicking<br>(c) Frame buffer (d) Pixel Persistence | (0.5 mark * 4) | **2** |
| | ii. | DDA line drawing algorithm<br>As per explanation | | **3** |
| | iii. | Use the Bresenham's algorithm to rasterize the line.<br>Solution<br>Table<br>Graph | <br>3 marks<br>1 mark<br>1 mark | **5** |
| OR | iv. | Generate all the points to form a circle<br>Solution<br>Diagram | <br>4 marks<br>1 mark | **5** |
| Q.3 | i. | Perform a 45 degree rotation of a square having vertices A(0,0), B(0,2), C(2.0), and D(2,2) about the origin.<br>Solution<br>Diagram | <br>3.5 marks<br>0.5 mark | **4** |
| | ii. | Illustrate the working of Cohen Sutherland line clipping algorithm and apply the algorithm<br>Algorithm<br>Solution | <br>3 marks<br>3 marks | **6** |
| OR | iii. | Consider a polygon with vertices P1P2P3P4. Apply Sutherland Hodgman algorithm to find the clipped polygon.<br>1.5 marks for each | <br>(1.5 marks * 2) | **6** |
| Q.4 | i. | Definition of HSV color model<br>Diagram | 2 marks<br>1 mark | **3** |
| | ii. | Calculate the effect of scaling when scaling factor $S_x$= 1/2, $S_y$= 1/3 and $S_z$= 1?<br>As per the solution | | **7** |
| OR | iii. | Differentiate following:<br>(a) Diffuse & Specular reflection.<br>(b) Gouraud & Phone Shading | <br>3.5 marks<br>3.5 marks | **7** |
| Q.5 | i. | Multimedia<br>Types<br>Applications of multimedia | 1 mark<br>1.5 marks<br>1.5 marks | **4** |
| | ii. | Components of digital audio system<br>Features of digital audio processing software | 3 marks<br>3 marks | **6** |
| OR | iii. | Write short notes on following: 1.5 marks for each<br>(a) JPEG (b) MIDI (c) AVI (d) WMV | (1.5 marks * 4) | **6** |
| Q.6 | | Attempt any two: | | |
| | i. | Animation<br>Principles of animation<br>Application of animation | 1.5 marks<br>2 marks<br>1.5 marks | **5** |
| | ii. | Multimedia Databases<br>Layers of Multimedia Architecture | 2 marks<br>3 marks | **5** |
| | iii. | Basics of Audio compression<br>Basic audio compression techniques<br>Standards | 2.5 marks<br>1.5 marks<br>1 mark | **5** |

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