

Computer Graphics 11/02/2012
NOTE: 1) All questions are compulsory. 3
2) Draw neat and labelled diagrams wherever necessary.

Q.1. A) Define the following terms:- (6 marks)

- Image and Object.
- Rasterization and Scan-conversion.
- Window and Viewport.

B) Write a note on DDA line drawing algorithm. Consider a line AB with $A = (-1, 0)$ and $B = (-8, 4)$. Apply simple DDA algorithm and calculate the pixels on this line. (4 marks)

C) A) Describe Bresenham's circle generating algorithm. Using its concept, calculate first five pixels in one octant. The radius of the circle is 10 and the centre of the circle is at $(50, 60)$. (5 marks)

B) Explain raster scan and random scan display mechanism. (5 marks)

C) Write a note on CRT. (5 marks)
OR.

D) What is computer graphics? Describe various applications of computer graphics. (5 marks)

Q.3. A) What are combined transformations? Perform the following transformations on a $\triangle ABC$, where co-ordinates are $A = (2, 3)$, $B = (7, 5)$ and $C = (2, 5)$ and sketch all the desired output.

- Scaling in y direction by factor $S_y = 2$.
- Reflection about x-axis.

(5 marks)

B) Explain reflection as a 2D transformation. Considering a unit square in a 2D plane, perform all possible reflection transformations on this square. (5 marks)

C) What is shearing? On a unit square situated at the origin, perform all possible shears. Sketch all the sheared figures. (5 marks)

Q.3. D) Write a note on 2D scaling. With the help of appropriate examples explain scaling with its different cases. — (5 marks)
OR

Q.4. A) With respect to 3D transformations, explain rotation. Give all the matrices for rotation in clock-wise and counter-clockwise direction. — (5 marks)

B) What is projection? Describe oblique projection with its categorization. — (5 marks)

C) Write a note on 3D objects in homogeneous co-ordinates. — (5 marks)
OR

D) Represent an overview of the subclasses of planar geometric projections diagrammatically. Explain perspective projection & its types. — (5 marks)

Q.5. A) What is line clipping? Explain Cohen Sutherland line clipping algorithm. — (5 marks)

B) Explain scan-line algorithm. — (5 marks)

C) Describe connectivity of graphs. Explain Flood-fill algorithm. — (5 marks)
OR

D) Explain viewing transformations in 2D. What are the steps in 2D viewing pipeline. — (5 marks)

Q.6. A) Explain the concept of painter's and reverse painter's algorithm. — (5 marks)

B) Explain Z-Buffer's algorithm for hidden surface removal. Give its advantages and disadvantages. — (5 marks)

C) What is back-face culling? Explain. — (5 marks)
OR

D) Define coherence. Explain different types of coherence. — (5 marks)

7. A) Write a note on morphing.

— (5 marks)

B) What is rendering in computer graphics? Explain — (5 marks)

C) Define computer animation. Explain the construction of an animation sequence. — (5 marks)

OR

D) Write a note on key-frame and procedural animation. Also compare them. — (5 marks).

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