



Name :

Roll No. :

Invigilator's Signature :

**CS/B.Tech (CSE)/SEM-6/CS-603/2010
2010**

COMPUTER GRAPHICS AND MULTIMEDIA

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

$$10 \times 1 = 10$$

i) If blue is represented as 001 the yellow is represented
as

a) 001 b) 010

c) 101 d) 110.

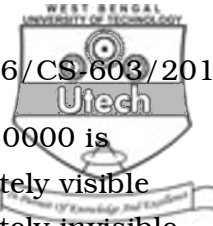
ii) A 24-bit plane colour frame buffer with three 10-bit
wide colour look up tables can have number
of colours.

a) 2^{24} b) 2^8

c) 2^{48} d) 2^{30} .



- iii) DAC means
- a) direct access coding
 - b) digitally activated compression
 - c) direct area clipping
 - d) digital to analog converter.
- iv) acts as anode in CRT.
- a) The phosphorous coating
 - b) The glass panel
 - c) The deflectors
 - d) None of these.
- v) Slope of the line joining the points (1, 2) and (3, 4) is
- a) 0
 - b) 1
 - c) 2
 - d) 3.
- vi) In Bresenham's circle generating algorithms, if (x , y) is the current pixel position then the x -value of the next pixel position is
- a) x
 - b) $x - 1$
 - c) $x + 1$
 - d) $x + 2$.
- vii) Run length coding is used for
- a) image smoothening
 - b) image compression
 - c) image colouring
 - d) image dithering.
- viii) If X_L, X_R, Y_B, Y_T represent the four parameter of x -left, x -right, y -bottom and y -top of the clipping window and (x , y) is a point inside the window then
- a) $X_L \leq x \leq X_R$ and $Y_B \leq y \leq Y_T$
 - b) $X_L \leq x \leq X_R$ and $Y_B \geq y \geq Y_T$
 - c) $X_L \geq x \geq X_R$ and $Y_B \leq y \leq Y_T$
 - d) $X_L \geq x \geq X_R$ and $Y_B \geq y \geq Y_T$.



- ix) A line with end point codes as 0000 and 0000 is
 a) partially invisible b) completely visible
 c) trivially visible d) completely invisible.
- x) Which device is used to grasp a 'virtual object' ?
 a) Space ball b) Data glove
 c) Digitizer d) Touch panels.
- xi) How many channels are specified by MIDI standard ?
 a) 16 b) 24
 c) 32 d) None of these.
- xii) Lossy image simplification is based on operation.
 a) DCT b) CCIT
 c) ISO d) DMS.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Write the properties of B-spline. In what respect it differs from Bezier curve ? $3 + 2$
3. Write boundary-fill algorithm for region filling. Compare and contrast the boundary-fill algorithm and flood fill algorithm. $3 + 2$
4. Explain Liang-Barsky algorithm for line clipping.
5. What do you mean by MIDI ? Write down the components of MIDI. $2 + 3$
6. Define projection and mention its importance. Derive the transformation matrix for a perspective projection. $3 + 2$

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Derive Mid point circle drawing algorithm.
 b) Using Mid point circle drawing algorithm draw a circle with radius 10 unit.
 c) Define random and raster scanning. $7 + 5 + 3$



8. a) Derive the transformation matrix for rotation about any axis.
b) Explain the reflection of a 2D figure on $y = mx + c$. Derive its component matrix.
c) What is homogeneous co-ordinate ? Why is a homogeneous co-ordinate system needed in transformation matrix ? 5 + 7 + 3
9. a) Derive the transformation matrix for perspective projection.
b) Suppose a window has its lowest left line corner at $(-3, -2)$ and its upper right corner at $(4, 2)$. Find the visible portion of the line joining points $(-4, 2)$ and $(3, 5)$ using Cohen Sutherland line clipping algorithm.
c) Write and explain Sutherland-Hodgeman algorithm to clip a polygon. 5 + 6 + 4
10. a) Define morphing and masking.
b) Write down the basic step of JPEG.
c) What do you mean by key frame and tweening ?
d) Write few audio file formats. Explain the advantages and disadvantages of MIDI over digital audio. 2 + 2 + 5 + 2 + 1 + 3
11. Write short notes on any *three* of the following : 3 × 5
- a) MPEG
 - b) Shading model
 - c) Virtual reality
 - d) Cohen Sutherland line clipping algorithm
 - e) CRT.
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