

Name :

Roll No. :

Invigilator's Signature :

CS/MCA/SEM-4/MCA-402/2011

2011

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 the following :

10 × 1 = 10

- i) Refreshing on raster scan displays is carried out at the rate of
 - a) 60 to 80 frames per sec
 - b) 40 to 60 frames per sec
 - c) 30 to 60 frames per sec
 - d) none of these.

- ii) The maximum number of points that can be displayed without overlap on a CRT is referred to as
 - a) Resolution
 - b) Persistence
 - c) Attenuation
 - d) None of these.

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iii) Dragging in computer graphics can be achieved through which of the following transformations ?

- a) Translation
- b) Rotation
- c) Scaling
- d) Mirror reflection.

iv) GIF supports

- a) 256 colours
- b) 512 colours
- c) 1024 colours
- d) 16 million colours.

v) How many matrices are required to rotate an object about a point (x, y) ?

- a) 2
- b) 3
- c) 4
- d) 5.

vi) Which of the following techniques is used in Midpoint subdivision algorithm ?

- a) Binary search
- b) Bubble sort
- c) Linear search
- d) Sequential search.



vii) The total number of pixels put on for the line starting at (1, 1) and ending at (12, 7) would be

- a) 7
- b) 11
- c) 12
- d) more than 12.

viii) DDA stands for

- a) Digital Differential Analyzer
- b) Digital Data Analyzer
- c) Digital Distributed Analyzer
- d) None of these.

ix) The format of storing digital audio in multimedia application is

- a) JPEG
- b) TIFF
- c) WAV
- d) BMP.

x) A line with end point codes 0000 and 0100 is

- a) partially invisible
- b) completely invisible
- c) completely visible
- d) cannot be determined.

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GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following.

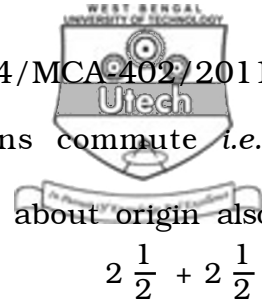
3 × 5 = 15

2. Suppose an RGB raster system is to be designed using an 8 inch × 10 inch screen with a resolution of 100 pixels per inch in each direction. If we want to store 6 bit per pixel in the frame buffer, how much storage in bytes do we need for the frame buffer ? Also find out the Aspect-ratio of the raster system.

3. a) What is Nyquist criteria ? What effect is produced if it is violated ?

b) Explain why a digital sound wave is regarded as a degraded version of the original analog wave, using the concept of quantization error.

4. What is scan conversion ? Explain the principle of Bresenham's line drawing algorithm mathematically.



5. Prove that two scaling transformations commute i.e., $S_1 S_2 = S_2 S_1$ and two 2D rotations about origin also commute i.e., $R_1 R_2 = R_2 R_1$.

$$2 \frac{1}{2} + 2 \frac{1}{2}$$

6. Explain key frames and twinning with examples. What are the advantages of computer assisted animation ?

GROUP - C

(Long Answer Type Questions)

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

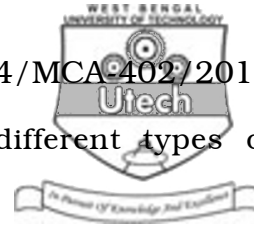
- 7. a) What is composite transformation ?
- b) Generate matrix for rotating an angle θ about an arbitrary point (h, k) in 2D plane.
- c) Perform the 45° rotation of triangle A $(0, 0)$, B $(1, 1)$, C $(5, 2)$: about point $p (- 1, - 1)$
- d) Show that a composite 2D transformation is necessarily of the form

$$\begin{pmatrix} a & b & c \\ d & e & f \\ 0 & 0 & 1 \end{pmatrix} \quad 1 + 5 + 4 + 5$$

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8. a) Write down the Cohen-Sutherland subdivision line clipping algorithm (A short discussion about the binary region codes assigned to line endpoints must precede the algorithm).
- b) What are the advantages / disadvantages (if any) of the above algorithm ?
- c) What do you understand by Homogeneous Coordinate ?
- d) Distinguish between Raster-Scan display & Random Scan display. 7 + 3 + 3 + 2
9. a) How are superscript and subscript formatted in HTML document ? How can you use style sheet to define your own formatted subscript and superscript ?
- b) Describe the use of < FRAMESET > tag with example.
- c) Write an HTML script for refreshing a topic within the webpage with example.
- d) Write down two attributes of < BODY > tag. Explain their utility with suitable example. 4 + 3 + 5 + 3
10. a) Describe the scan line Z-buffer algorithm.
- b) What is Phong shading ?
- c) What are interior and exterior clippings ? What are their applications ?
- d) What is the difference between windowing and viewing ? Explain it with an example. 5 + 3 + 4 + 3



11. Explain the principle of operation of different types of synthesizers. What is meant by MIDI ?

Discuss the format of MIDI messages. How is a channel message different from a system message ?

How is the MIDI file format different from the WAV format ?

4 + 1 + 2 + 4 + 4

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