Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech(CSE/OLD)/SEM-6/CS-603/2013

2013

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 the following : 10 × 1 = 10

   i) What will be the size of 200 × 1600 image of 16 bit depth ?

   a) 29·29 MB b) 117 MB

   c) 192 kB d) none of these.

   ii) Raster Scanning starts from

   a) top lef corner of the screen

   b) top right corner of the screen

   c) bottom right corner of the screen lines

   d) bottom left corner.

   iii) CD-ROM operates on

   a) 1 Mode b) 2 Mode

   c) 3 Mode d) 4 Mode.

   iv) MIDI is a/an

   a) protocol b) instrument

   c) cable d) none of these.

v) Which one is the CMY coordinates of a colour at (0·2, 1, 0·5) in the RGB space ?

a) (0·8, 0, 0·5) b) (0·7, 0·2, 0)

c) (0, 0·5, 0·8) d) (0·4, 0·8, 0·5).

vi) Control points are used to control the ..... of the curve.

a) shape b) edges

c) values d) iterations.

vii) In view-port clipping of 3D viewing, the region code contains..... number of bits.

a) 6 b) 4

c) 5 d) 7.

viii) Refreshing on raster scan display is carried out at the rate of

a) 60-80 frames/sec b) 30-60 frames/sec

c) 40-60 frames/sec d) none of these.

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

a) JPEG b) TIFF

c) WAV d) BMP.

x) GIF supports

a) 256 colours b) 512 colours

c) 1024 colours d) 16 million colours.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Exlain Mid-point Circle drawing algorithm. Using that algorithm, draw a circle with radius 5 and centered at (5, 5). 2 + 3

3. a) What do you mean by homogeneous coordinate ?

b) Suppose there is a rectangle *ABCD* whose coordinates are *A* (1, 1), *B* (4, 1), *C* (4, 4), *D* (1, 4) and the window coordinates are (2, 2), (5, 2), (5, 5), (2, 5) and the given view port location is (0·5, 0), (1, 0), (1·5, 0·5), (0·5, 0·5). Calculate the viewing transformation matrix. 1 + 4

4. Prove that two scaling transformations commute *i.e.* S1S2 = S2S1 and two 2*D* rotations about origin also commute *i.e.*, *R*1*R*2 = *R*2*R*1.

5. What is morphing ? Differentiate between morphing and shape tweening. 2 + 3

6. Explain the basic principles of animation. What are keyframe and tweening ? 3 + 2

7. What do you mean by *B*-Spline curve ? Discuss the properties of *B*-Spline curve. 2 + 3

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

8. a) Explain Cohen-Sutherland line clipping algorithm. 5

   b) What are the advantages and disadvantages of it. 4

   c) Use above algorithm to clip line *P*1(70, 20) and *P*2(100, 10) against a window lower left corner (50, 10) and upper right hand corner (80, 40). 6

9. a) Why do we use parametric representation of a curve ? Why do we require first order and second order continuities in a curve ? 3 + 3

   b) Explain the difference between uniform and non-uniform *B*-spline. 4

   c) Find the equation of Bezier curve which passes through the points (0, 0) and (–2, 1) and is controlled through points (7, 5) and (2, 0). 5

10. a) Explain the principles of operation of different types of synthesizers. What is meant by MIDI ? 4 + 1

b) Discuss the format of MIDI messages. 2

c) What do you mean by I-frame, B-frame and P-frame in context of video compression ? 4

d) What are the major components of a multimedia document ? How can they be compiled together ? 4

11. a) Describe the scan line *Z*-buffer algorithm. 5

b) What is phong shading ? 3

c) Explain the difference between boundary fill and flood fill algorithm. 2

d) Discuss the major issues in scan line polygon filling algorithm. Explain the utility of active edge list. 5

12. Write short notes on any *three* of the following : 3 × 5

a) Sutherland-Hodgeman Polygon Clipping algorithm

b) Cubic *B*-Spline

c) Discrete Cosine T ansformation

d) CAV and CLV.