C

Student Registration Number

COURSE CODE: DCAP504

COURSE TITLE: COMPUTER GRAPHICS

Time Allowed: 3 hours **Max. Marks: 80**

1. *This paper contains 10 questions divided in two parts on 1 page.*

2. Part A is compulsory.

3. In Part B (Questions 2 to 10), attempt any 6 questions out of 9. Attempt all parts of the selected question.

4. *The marks assigned to each question are shown at the end of each question in square brackets.*

5. *Answer all questions in serial order*.

6. The student is required to attempt the question paper in English medium only.

PART-A

Q1.

a) What is Computer Graphics? What are its application areas?

b) Define the terms: Window and Viewport.

c) What is the limitation of Sutherland Hodgeman polygon clipping algorithm?

d) Differentiate between Horizontal and Vertical Retrace.

e) Define Resolution and Persistence.

f) Draw diagram for region code of Cohen Sutherland line clipping algorithm.

g) What do you mean by jaggies?

h) What is Geometric Scaling? Explain it with a diagram, equations and matrix.

i) What is antialiasing?

j) Write down various hidden surface removal algorithms. [2*10=20 marks]

PART-B

Q2 What do you mean by Frame Buffer. Also differentiate between Bitmap and Pixmap. Suppose an RGB raster system is to be designed using an 10 inch x 12 inch screen with a resolution of 100 pixels per inch in each direction. If we want to store 6 bits/pixel in the frame buffer, how much storage (in bytes) do we need for the frame buffer? [10 marks]

Q3 Explain rasterization with differences between Raster graphics and Random graphics. [10 marks]

Q4 What are composite transformations? Describe transformation ML which reflects an object about a Line L: y=m*x+b. Also show the derivation for final matrix. [10 marks]

Q5 What is the need of hidden surface removal algorithms? Explain Back-Face Detection Algorithm. [10 marks]

Q6 Differentiate between Z-buffer and Scan Line Hidden surface removal algorithm. [10 marks]

Q7 Differentiate between Gouraud and Phong Shading Model. [10 marks]

Q8 Explain Sutherland Hodgeman polygon clipping algorithm with example. [10 marks]

Q9 Differentiate between Geometric and Coordinate Transformations. What is Geometric Shearing? Explain it with a diagram, equations and matrix. [10 marks]

Q10 Write down steps for Bresenham line drawing algorithm for both |m|<1. Locate intermediate pixels of a line having starting point at (2,3) and ending point at (11,5) using Bresenham line generation algorithm. [10 marks]