B.Sc. Semester-VI Examination, 2022-23

MATHEMATICS [Programme]

Course ID : 62110   Course Code : SP/MTH/604/SEC-4

Course Title : Computer Graphics

Time : 2 Hours   Full Marks : 40

The figures in the right-hand margin indicate marks.

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

Notations and symbols have their usual meaning.

1. Answer any **five** from the following questions:

$2 \times 5 = 10$

a) Define pixel and resolution.

b) List any four areas of applications of computer graphics.

c) Give the matrix representation for 2D Scaling.

d) What are the advantages of laser printers?

e) What is Fixed Point Scaling?

f) Define Scan Conversion.

g) What is meant by anti-aliasing?

h) Define refresh rate of a CRT monitor.

[Turn Over]

2. Answer any **four** from the following questions:

$5 \times 4 = 20$

a) Draw a diagram of a CRT and label its five major components.

b) Generate the points between the end points of a line viz. (2, 2) and (9, 6) by using Bresenham's line drawing algorithm.

c) Explain Cohen-Sutherland line clipping algorithm with a suitable example.

d) What is Uniform scaling? Consider a square with Left-bottom corner at (2, 2) and right-top corner at (6, 6). Apply the Scaling transformation which makes its size half.   1+4

e) Differentiate between Vector scan display and Raster scan display.   5

f) What is 8-connected region? Write down the Scan-Line polygon fill algorithm.   1+4

3. Answer any **one** of the following questions:

$10 \times 1 = 10$

a) Explain DDA line drawing algorithm with its drawbacks. Draw a line using DDA, having coordinates as (–1, –4) and (5, 6).   5+5=10

b) Describe 2-D transformation operations such as Translation, Scaling, Rotation, Reflection and Shearing with proper examples.   10

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