Graphic Era
Established by an Act of the State Legislature of Uttarakhand (Adhiniyam Sankhya 12 of 2011)
University under section 2(f) of UGC Act, 1956

End Term (Even) Semester Examination May-June 2025

Roll no.....

Name of the Program and semester: MCA 4th Semester
Name of the Course: Advanced Graphics and Visual Computing
Course Code: TMC 403(2)
Time: 3 hour
Maximum Marks: 100

Note:
(i) All the questions are compulsory.
(ii) Answer any two sub questions from a, b and c in each main question.
(iii) Total marks for each question is 20 (twenty).
(iv) Each sub-question carries 10 marks.

Q1. (2X10=20 Marks)
a. Implement the DDA line Algorithm in C Programming. [CO1]
b. Translate an object defined by A (0, 0), B (1, 0), C (1, 1) and D (0, 1) by 3 unit in X and Y direction respectively. [CO1]
c. Differentiate 3D Translation and 3D Scaling with the help of matrix representations. [CO1]

Q2. (2X10=20 Marks)
a. Design and implement the Flood-Fill Algorithm in C Programming. [CO2]
b. Define line clipping? Write down the program in C for Cohen Sutherland Algorithm. [CO2]
c. Differentiate orthographic & oblique projection. [CO2]

Q3. (2X10=20 Marks)
a. Draw Spline representations for a curve. [CO3]
b. Differentiate Bezier Curves & surfaces with example. [CO3]
c. Demonstrate Rational splines. [CO3]

Q4. (2X10=20 Marks)
a. Design a program for Painter's algorithm. [CO4]
b. Differentiate Affine and Coordinate system transformations. [CO4]
c. Explain Basic Rendering techniques. [CO4]

Q5. (2X10=20 Marks)
a. Differentiate Isosurfaces and Isocontours and explain how to create 2D Isocontours with Matplotlib. [CO5]
b. Differentiate Visualization of 2D/3D scalar fields. [CO5]
c. Explain Effective Color Mapping by Code in Python (Using Matplotlib). [CO5]