

KATHMANDU UNIVERSITY
End Semester Examination [C]
December, 2024

Level : B.E./B.Sc.
Year : III
Time : 2 hrs. 30mins.

20 DEC 2024

Course : COMP 342
Semester : I
F. M. : 40

SECTION "B"

[6 Q. × 4 = 24 marks]

Attempt ANY SIX questions.

1. Describe how computer graphics can be effectively used in Education and Training and Visualization applications? [2+2]
2. Describe Run-Length Encoding technique? Explain the basic video controller refresh operation with appropriate diagram. [1+3]
3. Scale the triangle with coordinate A (10,10), B (20,10) and C(15,15) to double its size keeping B(15,15) fixed? [4]
4. Clip a line with coordinates and L1(-1,4,4,9) against a rectangular window with dimension R(-2,2,2,5) using Liang Barsky line clipping algorithm? [1+3]
5. Differentiate between object space method and image space method? Explain the depth buffer method with necessary mathematics relation and examples? [1+3]
6. Describe Gouraud Shading with relevant example? Differentiate between Specular Reflection and diffuse reflection? [3+1]
7. Write Short notes on: [2+2]
 - a. CIE Color model
 - b. Design of Animation Sequences

SECTION "C"

[2 Q. × 8 = 16 marks]

Attempt ALL questions.

8. Derive all the required decision parameters for drawing a line with Slope greater than or equal to 1 using Bresenham Line drawing Algorithm. Consider the starting point of circle as (r, 0) where r is the radius of the circle. Digitize a circle with radius 10 and Center (50, 50) [6+2]
9. Derive a transformation matrix for producing any parallel projection onto the (X_v, Y_v) plane and write a condition for getting orthographic, cabinet and cavalier projection from the derived transformation matrix? Derive the composite transformation matrix for rotating a 3D object about an axis i.e parallel to X-axis (*make necessary assumptions*)? [4+1+3]

