





KATHMANDU UNIVERSITY  
End Semester Examination [C]  
November/December, 2023

29 NOV 2023

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

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

SECTION "B"

[6Q. × 4 = 24 marks]

Attempt *ANY SIX* questions.

1. What is Computer Graphics? Describe how can you make effective use of Computer Graphics in the field of Education and Training? [1+3]
2. Describe the term aspect ratio and persistence of a monitor? How much time is spent scanning across each row of pixels during screen refresh on a raster system with a resolution of 1280 by 1024 and a refresh rate of 60 frames per second? [2+2]
3. Scale the triangle with coordinate A (10,10), B (20,10) and C(15,15) to double its size keeping B(20,10) fixed?
4. What is the significance of Clipping in Computer Graphics? Explain Cohen Sutherland Line Clipping Algorithm with relevant example? [1+3]
5. Why is it easier to locate hidden surfaces when parallel projection is used? Explain Back face detection algorithm with supporting mathematical relations and examples? [1+3]
6. Describe Constant Intensity Shading with relevant example? Differentiate between Specular Reflection and Gouraud reflection? [3+1]
7. Write Short notes on: [2+2]
  - a. XYZ Color model
  - b. Design of Animation Sequences

SECTION "C"

[2Q × 8 = 16 marks]

Attempt *ALL* questions.

8. Derive all the required decision parameters for drawing a line with slope  $|m| < 1$  and write an algorithm for drawing a line with  $|m| < 1$  and  $|m| \geq 1$  using Bresenham algorithm. Digitize a circle with Center (20, 10) and radius 10 using Midpoint algorithm? [6 + 2]
9.
  - a. What is the importance of projection in 3D viewing? Describe 1 point and 2 point perspective projection with illustration? [1+2]
  - b. Explain 3D rotation about an axis which is not parallel to any one of the coordinate axes (Deduce the final transformation matrix)? [5]

