POKHARA UNIVERSITY

Level: Bachelor Semester: Fall Year : 2019
Programme: BE Full Marks: 100
Course: Computer Graphics Pass Marks: 45
Time : 3hrs.

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

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Explain the use of computer graphics emphasizing the application of graphics in the field of entertainment. 8
   b) Consider a non-interlaced raster monitor with a resolution of 1280x1024. If horizontal and vertical retrace times are 20 microsecond each, than calculate the fraction of the total refresh time per frame spent in retrace of the electron beam? Assume refresh rate of 60 frames per second. 7
2. a) Define Video Controller? Differentiate between Beam penetration and shadow mask method? 8
   b) Explain the working of DDA line drawing algorithm with suitable examples. Write its advantage and disadvantage. 7

OR

Explain Symmetrical property of circle. Write midpoint circle algorithm and apply that algorithm to find the pixel values of the circle whose radius r = 10 and centre of the circle = (0, 0).

3. a) Define Decision Parameter in Bresenham's line drawing? Digitize a circle $(x-2)^2 + (y-3)^2 = 25$ using a midpoint circle drawing algorithm. 8
   b) Determine window to viewport transformation matrix for window (5, 10) (15, 20) and for viewport (8, 12) (12, 18). Note the coordinates values are for lower left and upper right corner. 7
4. a) Why do you need clipping? Explain the Cohen Sutherland line clipping algorithm. 8
   b) Derive the composite matrix for reflection an object about an arbitrary axis in 3D Space. 7
5. a) Explain and derive transformation matrix of 3D rotation about a line 8

not parallel to any one axis.

b) Distinguish between Image space and Object space method. How A-buffer method removes the drawback of Z-buffer method. 7

6. a) What do you mean by ambient light? Compare between Additive and subtractive color model. 7

b) Define OPenGL? Explain the different file format used in Graphics to save image. 8

7. Write short notes on: (**Any two**) 2×5

a) Pros and Cons of Vector Graphics

b) A-Buffer Method

c) Need for Machine Independent Graphical Languages.