Answer any seven questions. All questions carry equal marks

1. (a) Suppose an RGB Raster system is to be designed using an 8-inch by 10-inch screen with a resolution of 100 pixels per inch in each direction. If we want to store 6 bits per pixel in the frame buffer, how much storage (in bytes) do we need for the frame buffer?

   (b) Assuming that a full colour (24 bit per pixel) RGB Raster system has a 512-by-512 frame buffer, how many distinct colour choices (intensity levels) would be available? How many different colours could we display at any one time?

   (c) Describe the basic refresh operation of the Video Controller of a Raster System.

                                                                        3+3+4

2. (a) Use the midpoint method to derive decision parameters that can be used to generate straight line segments with any slope.

   (b) Show the symmetric points, corresponding to (x,y) point on a circle. How do they help in efficient scan conversion?   5+2+3

3. (a) Write an algorithm for pattern filling where patterns are of size 2×2.

   (b) Why in the Ordered Edge list algorithm, the concept of Half-interval scan lines is introduced?   5+5

4. (a) Write a routine to split a concave polygon using Vector method and then apply any convex polygon clipping algorithm to clip individual polygons.

   (b) Write a routine to identify concave polygons.   2+4+4

5. (a) Determine the cubic Bezier Blending functions for five control points. Plot each function and mark the maximum and minimum values.

   (b) How B-Spline curve design method imposes local control over the shape of the curve?   6+4

6. Describe the depth buffer method to display the visible surfaces of a given polyhedron. How do we make the algorithm more efficient?   5+5

7. (a) Discuss the dependency between the natural appearance of objects and the properties of light and object surface.

   (b) What are the other factors help to produce more realistic object appearance?
                                                                        7+3

8. (a) What do you mean by Hue, Saturation and Intensity? Compare and contrast between gray level image and Colour image.

                                                                        4+6

9. (a) What are the factors based on which we classify the projections?

   (b) Which projection attempts to portray the general three-dimensional shape of an object and how?   4+1+5

10. Short Notes: Back face Detection Method, Knot Vector   5+5