Bangabandhu Sheikh Mujibur Rahman Science and Technology University
Department of Computer Science and Engineering
3rd Year 1st Semester B.Sc. Engineering Examination-2014

Course No: CSE 300 **Course Title:** Computer Graphics
Full Marks: 70 **Time: 4 hours**

N.B.
i) Answer **SIX** questions, taking any **THREE** from each section.
ii) All questions are of equal values.
iii) Use separate answer script for each section.

SECTION-A

Q.1 (a) What is frame buffer? Draw a frame buffer block for video display system. 4
(b) ~~Write down and~~ explain the midpoint line drawing algorithm. Assume A(4,4) and B(5,9) as the any two points of the lines. $7^{2/3}$

Q.2 (a) What do you mean by RGB and CMY model? Draw color cube for both model and find a relationship between them and find the CMY color value if RGB value is (0.7,0.3,0.5). 4
(b) Write down the algorithm (with appropriate comments) to convert RGB to HSV color model. 3
(c) Convert the following CMY to HSV color, where C = 0.7, M = 0.5 and Y = 0.4 $4^{2/3}$

Q.3 (a) Why two sets of decision variables and its derivatives are required in mid-point ellipse drawing? Explain the transition/ termination criteria from region 1 to region 2 in midpoint ellipse drawing algorithm. $6^{2/3}$
(b) What is meant by clipping? Explain Cohen-Sutherlands algorithm for line clipping. 5

Q.4 (a) The color format in BMP file is GRB, whereas the format in OpenGL is RGB. What will happen for the following colors if someone assumes BMP file as RGB format? $3^{2/3}$
(i) Red (ii) Green (iii) Blue (iv) Cyan (v) Magenta (v) Black
(b) Convert the following RGB Colors values to HSV. Explain each step carefully. 4
(i) (0.5, 0.7, 0.6) and (ii) (0.9 ,0.8 , 1)
(c) Shortly write about the application of computer graphics. 4

SECTION-B

Q.5 (a) What is meant by Mesh? Describe different kinds of mesh representations. 5
(b) What are the mesh simplification operations goals? Briefly explain varieties of mesh operations. 5
(c) What is Silvers? $1^{2/3}$

Q.6 (a) What is the difference between perspective and parallel projection? Explain with appropriate figure. 4
(b) Can you drive the blending function of Bezier curve from through the parametric equations(t) of Hermite curve? Here, Generalized curve Q(t) is defined as [x(t) y(t) z(t)]. 5
(c) Shortly note about HLS color model. $2^{2/3}$

Q.7 (a) Define C and G continuity. Does a curve is C continuous implies that it is G continuous also? 6
(b) Consider a quadratic parametric cubic curve Q(t) = T.M.G, where $T=[t^2,t,1]$. The geometry vector for this curve is defined as $G = [P_0,P_1,P_2]$. $5^{2/3}$
(i) Find the basic Matrix M.
(ii) Find the blending functions for this curve.

Q.8 (a) Define B Spline curves. Mention some properties of B Spline curves. 4
(b) What do you know about Z buffer? Suppose Z_1, Z_2 and Z_3 make a triangle. Describe the interpolation of z values along polygon edges. 4
(c) What do you know about ambient light? Explain with appropriate figure. $3^{2/3}$