



Terminal Examination – Semester Spring 2021

Course Title:	Computer Graphics			Course Code:	CSD353	Credit Hours:	3(2,1)
Course	Aamer Mehmood			Programme Name:	BS Computer Sciences		
Semester:	5 th , 7 th	Batch:	SP17,FA17	Section:	A,B,C	Date:	
Time Allowed:	3 Hours			Maximum Marks:	100		
Student's Name:				Reg. No.	CIIT/SDP-SP()-BCS-		

Important Instructions / Guidelines:

- Use proper indentation, comments, naming conventions and self-explanatory names if you want to secure better marks.

Q 1. (A). Suppose RGB raster system is to be designed using on 8 inch x 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 frame buffer? (5 marks)

(B). How much time is spent scanning across each column of pixels during screen refresh on a raster system with resolution of 800 X 600 and a refresh rate of 29 frames per second? (5 marks)

Q 2. Provide the Pseudo code of Bresenham's midpoint line drawing algorithm. (10 marks)

Q 3. Find a transformed point Q caused by rotating P (3, 5) about the origin through an angle of 60°. (10 marks)

Q 4. Prove that simultaneous shearing in both direction (X & y direction) is not equal to the composition of pure shear along x-axis followed by pure shear along y-axis. (10 marks)

Q 5. Rotate P= (3, 1, 4) by 30 degrees along Y-axis. (10 marks)

Q 6. How the world looks like in following situations?

1. without ambient light.
2. with too much ambient light. (10 marks)

Q 7. Find the intersection point and clip the line using Figure (1). (10 marks)

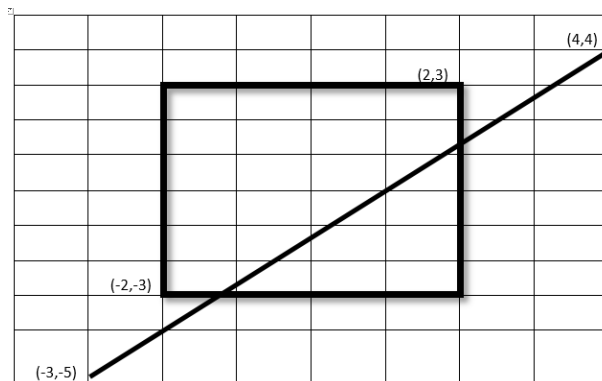


Figure 1.

Q 8. The Phong reflection model is an approximation of physical reality to produce good rendering under a variety of lighting conditions and material properties. Describe the four vectors, the model uses to calculate a color for an arbitrary point p. Illustrate with a figure. (10 marks)

Q 9. Derive an implicit equation for a torus whose center is at the origin. You can derive the equation by noting that a plane that cuts through the torus reveals two circles of the same radius. (10 marks)

Q 10. Given $B_0 = [1,1]$, $B_1 = [2,3]$, $B_2 = [3,1]$ and $B_3 = [4,3]$ the vertices of a Bezier polygon. Determine 7 points on the Bezier curve for $t=0$, $t=0.15$, $t=0.35$, $t=0.5$, $t=0.65$, $t=0.85$, $t=1$. (10 marks)