K. J. Somaiya College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)

End Semester Exam
NOV-DEC 2021

Max. Marks: 50
Duration: 1 Hr. 45 Min.
Class: T.Y.B.Tech Semester: V
Name of the Course: Computer Graphics & Visualization. Branch: Computer Engg.
Course Code: 2UCE511

Instructions:
(1) **All questions are compulsory.**
(2) **Draw neat diagrams wherever applicable.**
(3) **Assume suitable data if necessary.**

Question No.		Max Marks
Q1 (A)	Attempt the following multiple choice questions:	10
1.1	What components make up a light source in OpenGL? (a) Specular and Ambient. (b) Diffuse, Specular, and Ambient. (c) Diffuse and Ambient. (d) Diffuse, Opaque, Ambient.	02
1.2	What will be the value of initial decision parameter if we intend to draw a line between A(3, 6) and B(4, 9) using Bresenham's algorithm? (a) 6. (b) 5. (c) 3. (d) None of these.	02
1.3	Oblique projection with an. angle of 45^o to the horizontal plane is called as _____? (a) Cabinet projection (b) Isometric projection (c) Orthogonal projection. (d) Cavalier projection	01
1.4	Aspect ratio means: (a) Number of pixels. (b) Ratio of horizontal points to vertical points. (c) Ratio of vertical points to horizontal points. (d) Both (b) and (c).	01
1.5	What is the difference between glColor3d and glColor3f?	01

	(a) glColor3d is in real space, glColor3f is in integer space. (b) glColor3d allows 3d color operations, while glColor3f only allows 8-bit. (c) glColor3d only sets RGB, while glColor3f sets R,G,B and A. (d) glColor3d takes double arguments, while glColor3f takes float arguments.	
1.6	OpenGL uses a 3D Cartesian coordinate system. (a) True. (b) False.	01
1.7	Flood fill algorithm cannot be applied if there is _____. (a) More than one boundary color. (b) More than one interior color. (c) Single boundary color. (d) Single interior color.	01
1.8	Which one is not the neighbour of a pixel (x,y) in 4 -connected method ? (a) (x,y+1) (b) (x+1,y+1) (c) (x,y-1) (d) None of these.	01
Q1 (B)	Attempt ***any FIVE*** questions out of the following:	10
	(a) What is a Turtle Graphics Program? (b) How will you represent a curve in computer graphics? (c) What is a Vertex shader in OpenGL? (d) Write the transformation matrix for rotation about (i) origin. (ii) arbitrary point (Xp,Yp) by an angle α. (e) What do understand by isometric projection? (f) Discuss the *stair-case* effect observed in line drawing algorithm. (g) Mention any four input and output devices each associated with graphical operations.	
Q. 2	Attempt the following questions:	10
	(a) Derive the window to viewport transformation. (b) Briefly explain the working of Ray-Casting in computer graphics.	
Q. 3	Attempt ***any two*** of the following:	10
	(a) Explain any five 3D viewing functions in openGL. (b) Define the following terms:	

	(1) Pixel. (2) Intensity. (3) Resolution. (4) Animation. (5) Illumination. (c) Rotate a triangle PQR by an angle of 30^{o} with the following coordinates P(0,0), Q(10,2) and R(7,4). Calculate the new coordinates of the triangle after the transformation.	
Q. 4	Write short notes on ***any two*** of the following:	10
	(a) Bucky Ball. (b) Vector and Raster displays. (c) Illumination models. (d) Polygon-filling techniques.	