



JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular), April - May, 2015

B. Tech. in Computer Science Engineering, Semester IV

Roll No.....

COURSE CODE: CSE404

Time: 3 hours

Max. Marks: 100

COURSE TITLE: Foundation of Computer Graphics

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1	Attempt the following questions (1 mark for each)	10
i.	Two types of coordinates are_____. a) Positive and Negative b) Absolute and Relative c) Both a & b d) None	
ii.	A composite transformation matrix can be made by determining the _____ of matrix of the individual transformation. a) Addition b) Subtraction c) Product d) None of above	
iii.	Vector graphics is composed of _____. a) Pixels b) Paths c) Palette d) None of these	
iv.	Two dimensional color models are _____. a) RGB & CMKY b) RBG & CYMK c) RGB & CMYK d) None	
v.	The point about which an object is rotated is called _____. a) Fixed point b) Central point c) Pivot point d) None	
vi.	_____ can be produced by interpolating shading patterns across the polygon surfaces to eliminate or reduce the presence of polygon edge boundaries. a) Rasterizing b) Rendering c) Smoothing d)None	
vii.	A transformation that slants the shape of an object is called _____. a) Reflection b) Shear c) Distortion d) Scaling	
viii.	The region against which an object is clipped is called a _____. a) Clip window b) Boundary c) Enclosing rectangle d) Clip square	
ix.	The phenomenon of having a continuous glow of a beam on the screen even after it is removed is called as? a) Fluorescence b) Persistence c) Phosphorescence d) Incandescence	
x.	The intersection of three primary RGB color produces a) White color b) Black color c) Magenta color d) Blue color	
Q.2	Short answer type questions (4 questions @ 2.5 marks)	10
i.	List out the merits and demerits of DVST?	
ii.	Distinguish between convex and concave polygons.	
iii.	What is aliasing? Give two ways to reduce it.	

iv. What are the advantages and disadvantages of DDA line drawing algorithm?

Q.3A Use the midpoint method to derive decision parameters for generating points along a straight-line path with slope in the range $0 < m < 1$. Show that the midpoint decision parameters are the same as those in the Bresenham line algorithm.

Q.3B How long would it take to load a 640 by 480 frame buffer with 12 bits per pixel, 10^5 bits can be transferred per second? How long would it take to load a 24-bit per pixel frame buffer with a resolution of 1280 by 1024 using this same transfer rate?

Q.4 Derive the window-to-viewport transformation by first scaling the window to the size of the viewport and then translating the scaled window to the viewport position.

Q.5 Prove that 2D rotation and scaling are commutative if $S_x = S_y$ or if $\theta = n\pi$ where n is an integer and that otherwise they are not commutative i.e. $S(S_x, S_y).R(\theta) = R(\theta).S(S_x, S_y)$ only if $S_x = S_y$ or $\theta = n\pi$.

Q.6 Prove that the multiplication of three-dimensional transformation matrices for each of the following sequence of operations is commutative: (i) any two successive scaling operations (ii) any two successive rotations about any one of the coordinate axes.

OR

Q.6 Compare the number of arithmetic operations performed in the Cohen-Sutherland and the Liang-Barsky line-clipping algorithms for several different line orientations relative to a clipping window.

Q.7A Briefly discuss the midpoint ellipse generation algorithm.

Q.7B Show that two successive reflections about either of the coordinate axes is equivalent to a single rotation about the coordinate origin.

OR

Q.7B What is homogeneous coordinate? Show its importance in computer graphics operations with the help of an example.

Q.8 Compare merits and demerits of depth-buffer and A-buffer methods for visible surface detection. Briefly describe scan-line method for visible surface detection.

Q.9A Explain in brief the RGB, HSV and CMY color models.

Q.9B Explain phong and fast phong shading using a suitable object.

OR

Q.9B Describe the document architecture and formatting of files in the Multimedia system.

