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Question Paper Code : 91404

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

Fifth Semester

Computer Science and Engineering

CS 6504 – COMPUTER GRAPHICS

(Regulations 2013)

(Common to PTCS 6504 – Computer Graphics for B.E. (Part-Time) Fifth Semester –
Computer Science and Engineering – Regulations 2014)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. Define refresh/frame buffer.
2. What are the merits and demerits of direct view storage tubes ?
3. Derive the general form of scaling matrix about a fixed point (x_f, y_f) .
4. Write down the conditions for point clipping in window.
5. What are blobby objects ? Give two examples.
6. State the applications of Bezier splines.
7. How you define intensity ?
8. State Dithering technique.
9. Define morphing.
10. What is fractal ?

PART – B

(5×13=65 Marks)

11. a) i) Define and differentiate random scan and raster scan devices. (5)
ii) Using Bresenham's circle drawing algorithm plot one quadrant of a circle of radius 7 pixels with origin as centre. (8)
- (OR)
- b) i) How are event driven input devices handled by the hardware ? Explain. (7)
ii) Discuss the primitives used for filling. (6)



12. a) Explain about composite transformation in general and explain the following with matrix representations :
- Two successive translations. (3)
 - Two successive rotations. (3)
 - Two successive scaling. (3)
 - General pivot point rotation. (2)
 - General fixed point scaling. (2)

(OR)

- b) i) Elaborate the concept of viewing pipeline. (6)
 ii) Explain Sutherland-Hodgeman algorithm for polygon clipping. (7)

13. a) Write notes on :
- Quadric surfaces. (6)
 - Polygon surfaces. (7)

(OR)

- b) Explain a method to rotate an object about an axis that is not parallel to the coordinate axis with a neat block diagram and derive the transformation matrix for the same. (13)

14. a) Illustrate the following illumination models with suitable diagram : Ambient Light and Diffuse Reflection. (13)

(OR)

- b) Discuss the following color models with suitable diagram and equations : RGB, HSV and YIQ models. (13)

15. a) i) Discuss on the Grammar-based models in detail. (6)
 ii) Give a detailed note on the ways in which motion of objects can be specified in an animation system. (7)

(OR)

- b) i) Explain ray tracing method in detail. (6)
 ii) What is Morphing ? Explain in detail about morphing with an example. (7)

PART - C

(1×15=15 Marks)

16. a) i) Derive the matrix representation of composite transformation. (8)
 ii) Show that the Bezier curve always touches the starting point (for $u = 0$) and the ending point (for $u = 1$). (7)

(OR)

- b) i) Explain in detail about the properties of light and draw chromacity diagram. (8)
 ii) Rotate the point $P(2, -4)$ about the origin 45° in anti clockwise direction. (7)