Reg. No. : | | | | | | | | | | | | |

Question Paper Code : X20403

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
Fifth Semester
Computer Science and Engineering
CS6504 – COMPUTER GRAPHICS
(Regulations 2013)
(Common to : PTCS6504 – 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. What are the major application areas of Graphics ?

2. Brief on the governing equation of a circle.

3. What is meant by shearing ?

4. Define Clipping.

5. Differentiate parallel projection from perspective projection.

6. What is the need for space partitioning representations ?

7. Write any two Drawbacks of Phong Shading.

8. State the use of chromaticity diagram.

9. Give the basic principle of animation.

10. List the attributes of turtle in graphics.

11. a) i) Write and explain Bresenham's line drawing algorithm and trace the algorithm for the given points (2, 1) to (10, 12). **(7)**

    ii) List the advantages of Bresenham's algorithm over DDA algorithm. **(6)**

(OR)

  b) i) Explain the working principle of CRT with a neat diagram. **(7)**

    ii) Differentiate raster scan and random scan display systems. **(6)**

12. a) i) Explain in detail on any two basic two dimensional geometric transformations. **(7)**

    ii) Rotate the point P (2, –4) about the origin 30° in anti-clockwise direction. **(6)**

(OR)

  b) i) Derive the matrix representation of composite transformation. **(7)**

    ii) What are the stages involved in 2D viewing transformation pipeline ? Explain briefly about each stage. **(6)**

13. a) i) Derive the parametric equation for a cubic Bezier curve. **(7)**

    ii) Compare and contrast Orthographic, Axonometric and Oblique projections. **(6)**

(OR)

  b) i) Write down the Back face detection algorithm. **(7)**

    ii) How will you perform three dimensional rotation about any arbitrary axis in space ? **(6)**

14. a) Explain in detail on RGB and HSV colour models. **(13)**

(OR)

  b) Write notes on Phong model and Warn model in detail. **(13)**

15. a) Explain how to create a morphing effect in computer animation with suitable equations with an example. **(13)**

(OR)

  b) Explain the purpose and working of ray tracing method with suitable diagram and also explain about ray surface intersection calculations. **(13)**

PART – C **(1×15=15 Marks)**

16. a) Use the Cohen Sutherland algorithm to clip line P1(70, 20) and P2 (100, 10) against a window lower left hand corner (50, 10) and upper right hand corner (80, 40), **(15)**

(OR)

b) Suppose we have a B-spline curve of degree 3 with a knot vector as follows : **(15)**

u0 to u3 u4   u5   u6   u7   u8 to u11

   0   0.2 0.4 0.6 0.8   1

Insert a new knot t = 0.5, find new control points and new knot vector.

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