

Total No. of Questions : 8]

SEAT No. :

**P1529**

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**S.E. (Computer Engineering) (Artificial Intelligence &  
Data Science) (Computer Science & Design Engg.)**

**COMPUTER GRAPHICS**

**(2019 Pattern) (Semester-III) (210244)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) Attempt Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Figures to the right indicate full marks.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Assume Suitable data if necessary.

**Q1) a)** Differentiate between Orthographic Projection and Isometric Projection. [5]

**b)** What is transformation and write transformation matrix for: [5]

- i) 3D translation using homogenous coordinate system
- ii) 3-D rotation about X-axis.

**c)** Consider the square A (1, 0), B(0, 0), C(0, 1), D (1, 1). Rotate the square ABCD by 45° anticlockwise about point A (1,0) [8]

OR

**Q2) a)** What are the types of projection and write in brief about each type of projections. [5]

**b)** Derive 3D transformation matrix for rotation about a principal axis. [5]

**c)** A triangle is defined by  $\begin{bmatrix} 2 & 4 & 4 \\ 2 & 2 & 4 \end{bmatrix}$  Find transformed coordinates after the following transformation. [8]

- i) 90° rotation about the origin.
- ii) Reflection about line X=Y

**Q3) a)** What is Backface? Explain Backface Detection and removal. [6]

**b)** Explain and compare point source and diffuse illumination. [5]

**c)** Compare RGB and HSV color model [6]

OR

*P.T.O.*

- Q4)** a) Write short note on Painters Algorithm [6]  
b) Explain Halftone shading [5]  
c) Explain the following terms with examples. [6]  
i) Colour gamut  
ii) Specular Reflection  
iii) Diffuse reflection

- Q5)** a) Write a short note on interpolation and approximation. [4]  
b) Explain Blending function for B-spline curve. [7]  
c) What are fractals? Explain Triadic Koch in detail. [7]

OR

- Q6)** a) Explain the Bezier curve. Enlist its properties. [4]  
b) Draw and explain Hilbert's curve with an example [7]  
c) With suitable example write short note on the fractal lines. [7]

- Q7)** a) Explain deletion of segment with suitable example. [7]  
b) What is Morphing and write the applications of Morphing. [3]  
c) Draw block diagram of NVIDIA workstation and explain it in brief. [7]

OR

- Q8)** a) Write a short note on motion specification method based on. [7]  
i) Geometric and kinematics information.  
ii) Animation languages  
b) Write any three important features of NVIDIA gaming platform [3]  
c) Explain renaming of a segment with suitable example. [7]

