

**BACHELOR OF TECHNOLOGY (C.B.C.S.) (2014 COURSE)**  
**B.Tech.Sem - V MECHANICAL : WINTER- 2022**  
**SUBJECT : ADVANCED COMPUTER GRAPHICS & SOLID MODELLING**

Day : Monday

Time : 02:30 PM-05:30 PM

Date : 12/12/2022

**W-13447-2022**

Max. Marks : 60

**N.B**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Assume suitable data if **NECESSARY**.

**Q.1** Derive the algorithm for pixel location using midpoint circle algorithm. **(10)**

**OR**

Write a short note on i) polygon filling ii) scan line filling **(10)**

**Q.2** Derive concatenated transformation matrix for reflection with respect to a line. **(10)**

**OR**

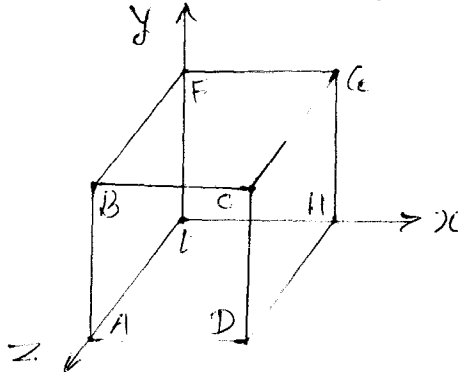
A triangle ABC with vertices A (50, 40), B (100, 60), and C (70, 80) by using scale factor  $S_x=0.7$ ,  $S_y=0.5$  about the point A. **(10)**

- Determine
- i) Composite transformation matrix
  - ii) Coordinates of the vertices for scaled triangle

**Q.3** Explain orthographic transformation and isometric transformation. **(10)**

**OR**

Twist the 2 unit cube shown below by 0.2 units in all six shear directions. **(10)**



**Q.4** A circle is represented by center point (7,7) and radius 7 units. Find the parametric equation for circle by recursive method and determine the various points on the circle if increment of angle is  $30^\circ$ . **(10)**

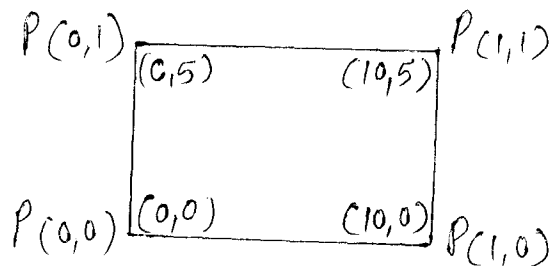
**OR**

Compare parametric representation of 2D and 3D curves in parametric space with its components. **(10)**

**Q.5** Explain the parametric representation of surface in CAD/CAM system. **(10)**

**OR**

Find the equation for Bezier surface with four corner points as shown below. Also find the midpoint of the surface. **(10)**



**Q.6** What is boundary representation? Explain the basic building blocks used for boundary representation. **(10)**

**OR**

Explain the sub section of IGES file. **(10)**