[6002]-204

S.E.(Automation & Roboitics/Mechanical/Automobile &Mechanical/ Mechanical Sandwich)
SOLID MODELING AND DRAFTING
(2019 Pattern) (Semester - III) (202042)

Time : 2½ Hours]   *[Max. Marks : 70*

Instructions to the candidates:
1) *Answer 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) *Draw the neat sketch wherever necessary.*

Q1) a) List out the various features of solid modeling?   **[4]**

b) What is sweep representation in solid modeling? Explain any four types with neat sketches?   **[8]**

c) What are solid representations? Explain the properties that a solid model should capture mathematically.   **[8]**

OR

Q2) a) Explain the concept of constructive solid geometry with suitable example?   **[4]**

b) Write a short note on following related to CAD,   **[8]**

     i) Design for manufacturing

     ii) Design for assembly

     iii) Design for disassembly

     iv) Design for safety

c) What do you mean by half space in solid modeling? Explain with types and suitable example?   **[8]**

P.T.O.

Q3) a) A triangle ABC with vertices A(2, 4) B (4, 6), and C(2, 6) is to be reflected about the line $x - 2y + 4 = 0$. **[8]**

Determine:

i) The composite transformation matrix; and

ii) The coordinates of the vertices for a reflected triangle.

b) What is the significance of homogeneous coordinates in geometric transformations? Explain the two dimensional Translation, Rotation, Scaling and Reflection in matrix form. **[8]**

OR

Q4) a) Prove that the multiplication for transformation matrices for each of the following sequence of operation is commutative, **[8]**

i) Two successive rotations.

ii) Two successive translations.

iii) Two successive scaling.

Also prove in general uniform scaling is cumulative but not about non-uniform scaling.

b) Explain the concept of orthographic and perspective view in computer graphic with matrix form for various views? **[8]**

Q5) a) List out the points to be considered for Best Practices of CAD conversion. What are key aspects that are essential and to be considered while performing CAD conversion from one system to another? **[8]**

b) Explain the concept of data exchange in CAD with its types of content and any two types? **[8]**

OR

Q6) a) Define additive manufacturing? Explain the 3D printing with principal of working, advantages, disadvantages and applications? **[8]**

b) Explain the concept of multibody dynamics with suitable example and applications? **[8]**

Q7) a) Define Direct Data Translators? Explain the role of neutral file formats in CAD with its advantages and disadvantages? **[10]**

b) Explain CAD customization with advantages, disadvantages and applications? **[8]**

OR

Q8) a) Explain the advantages of PMI over conventional 2D drawings? List out the advantages user can achieve by using PMI in creating 2D drawings. **[10]**

b) Explain the following Types of customization with suitable examples, (any two) **[8]**

i) Cosmetic

ii) Transparent

iii) Adaptive

iv) Collaborative

◄► ◄► ◄►