



## MUTHAYAMMAL ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Accredited by NAAC & Affiliated to Anna University)

Rasipuram - 637 408, Namakkal Dist., Tamil Nadu.

### Department of Robotics and Automation Question Bank

Course Code & Course Name : 19RAC11 COMPUTER AIDED DESIGN & MANUFACTURING

Year/ Sem /Sec :

#### Unit-I: FUNDAMENTALS OF COMPUTER GRAPHICS

##### Part-A (2 Marks)

1. Define CAD.
2. List the various stages in the life cycle of a product.
3. Define optimization.
4. Mention any four applications of computer aided design in mechanical engineering.
5. Identify the steps involved in conceptual design in morphology design.
6. Name the factors considered for selecting CAD.
7. Draw the flow diagram of sequential engineering.
8. Draw the design process layout of ohsuga model.
9. Mention the different phases in pahl and beitz model.
10. Discuss about the morphology design

##### Part-B (16 Marks)

1. Define design process. Draw flow diagram and explain its function. (16)
2. What is meant by concurrent engineering? Describe the various schemes for concurrent Engineering. (16)
3. List down the 2D transformation matrix for the following transformation processes. (16)
4. (i) Translation (ii) Scaling (iii) Rotation (iv) Shearing. (16)
5. (I) Describe homogeneous coordinate transformation system and matrix. (8)  
(ii) Examine composite transformation. How is it useful? (8)

#### Unit-II : GEOMETRIC MODELING

##### Part-A (2 Marks)

1. Define geometrical modeling.
2. List the main drawback of wireframe modeling.
3. Define curve and free form curve.
4. Write down Bezier matrix.

5. Mention any four characteristics of Bezier curves
6. Analyze the types of parametric Bi-Cubic surfaces used in CAD.
7. Differentiate the advantages and disadvantages of Bezier surface.
8. Assess the various forms of solid model representation.
9. Mention the advantages and disadvantages of CSG.
10. Formulate the rules to be followed in topological consistency.

**Part-B (16 Marks)**

1. Identify the formulation involved in Bezier surface and cubic Bezier surface. (16)
2. Summarize how solids are represented and describe neatly the various types of solid modeling Approaches. (16)
3. Describe briefly boundary representation (B-rep) and Constructive Solid Modeling (CSG) in solid Modeling. (16)
4. Examine briefly about coons surface and Hermite Bicubic surface formulation. (16)
5. (i) Point out the mathematical representation of curves (8)  
(ii) Analyze the steps involved in Bezier (8)

**Unit-III : VISUAL REALISM**

**Part-A (2 Marks)**

1. Define visual realism.
2. Classify the components of Visual realism.
3. Identify the applications of visual realism.
4. List the various approaches of visual realism.
5. Compare object space method and image space method.
6. Formulate the visibility of parts of objects depends on.
7. Name the various test to determine visibility.
8. Show the types of coherence.
9. Apply the generic algorithm for hidden line removal.
10. Survey the use of lighting model or Shading model

**Part-B (16 Marks)**

1. Explain the techniques used for visual realism. (ii) Illustrate any four visibility techniques in Computer graphics. (16)
2. i) Summarize about object space method and image space method. (8)  
(ii) Outline the hidden surface removal algorithm with an example. (8)
3. What are illumination models or shading models? Explain them in detail. (16)
4. What is Ray tracing and explain the process with its algorithm. (16)

5. Summarize about the coherence and explain its types. (8)
- (i) List any three shading enhancement methods. (ii) Relate how Phong shading differs from Gourand shading. (8)

#### **Unit-IV : ASSEMBLY OF PARTS**

##### **Part-A (2 Marks)**

1. Define assembly modeling.
2. List down the assembly modeling approaches.
3. Identify the techniques in evaluation of assembly sequences.
4. Give the applications of hole basis system and shaft basis system.
5. Name the factors that influence the amount of tolerance to be given on part.
6. Tabulate unilateral and bilateral tolerance.
7. Explain the types of fits.
8. Interpret the methods of kinematic analysis.
9. Discuss about first moments of inertia.
10. Define assembly modeling.

##### **Part-B (16 Marks)**

1. List the importance of assembly modeling and identify the various steps in generations of Assembly model. (8)
  - (i) Examine any two Assembly modeling approaches. (ii) Write short notes on mating conditions (8)
  2. Describe the representation of assembly and assembly plans. (16)
  3. Write short notes on inference of position and orientation. (16)
  4. Define geometric tolerance. Discuss in detail about the types of tolerances. (16)
  5. Summarize about preferred numbers, fits and types of fits. (8)
- List the importance of assembly modeling and identify the various steps in generations of Assembly model. (8)

#### **Unit-V : CAD STANDARDS**

##### **Part-A (2 Marks)**

1. List down the various elements of CAD/CAM structure without graphics system.
2. Where does the graphics system position in CAD/CAM structure.
3. Define database.
4. Mention the need for graphic standards.
5. Name the various interface standards at different levels.
6. Write down the aim of graphic standardization.
7. Give the types of graphics standard.
8. Predict the features of GKS.
9. Classify GKS and sketch the layer model of GKS.

10. Compare PHIGS and IGS.

**Part-B (16 Marks)**

1. (i) Define Graphics Keneral System. Explain briefly with suitable examples. (16)
2. Examine IGES data Exchange format. (16)
3. Describe the data exchange standard and development in data exchange format. (8)  
(i) Write short notes on data base management. (8)
4. Identiy the thrust involved in developing CAD Standards. (16)
5. (i) Describe PHIGS. (ii) Show how data is exchanged between two cad systems. (8)  
(i) Summarize the standards for exchanging images. (ii) Discuss about open graphics library. (8)

**HoD**

**Course Faculty**