2/6/25 FN

Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. / B.Tech. / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, APRIL/ MAY 2025

DEPARTMENT OF MECHANICAL ENGINEERING

III Semester

ME5351 COMPUTER AIDED DESIGN

(Regulation 2019)

Time: 3 hrs. Max. Marks: 100

Upon completion of this course, the students will be able to:

CO1	Apply the fundamental concepts of computer graphics and its tools in a generic framework.
CO2	Create and manipulating geometric models using curves, surfaces and solids.
CO3	Apply concept of CAD systems for 3D modeling and visual realism.
CO4	Create and adding geometric tolerances in assembly modeling.
CO5	Apply standard CAD practices in engineering design.

BL – Bloom's Taxonomy Levels

(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

PART- A (10x2=20Marks)

(Answer all Questions)

Q. No.	Questions	Marks	CO	BL
1	What do you mean by geometric modeling?	2	1	L1
2	Differentiate between sequential and concurrent engineering.	2	1	L2
3	Compare geometry and topology with an example.	2	2	L2
4	What do you mean by sweep representation?	2	2	L1
5	State the need for hidden surface removal in visual realism.	2	3	L1
6	Compare shading and shadowing.	2	3	L2
7	Brief about the mass properties to be accounted in part assembly.	2	4	L1
8	What is meant by unilateral tolerance?	2	4	L1
9	Write a note on Open GL.	2	5	L1
10	Mention any two communication standards.	2	5	L1

PART- B (5x 13=65Marks)

Q.No.	Questions	Marks	CO	BL
11 (a)	Explain the following geometric transformations along with their respective model matrix: i. Scaling, ii. Mirroring, and iii. Translocation.	13	1	L3
	OR			
11 (b)	With a suitable example, explain the Bresenham's Line drawing algorithm.	13	1	L3

Q.No.	Questions	Marks	CO	BL
12 (a)	Compare and contrast the Hermite cubic curve, Bezier curve, and B – Spline curve.	13	2	L3
	OR			
12 (b)	Differentiate the top down approach and bottom up approach in geometric modeling with respect to their procedure, feature, applications, advantages and limitations.	13	2	L3
13 (a)	Discuss in detail about the following algorithms: i. Scan line coherence algorithm, and ii. Priority Algorithm.	13	3	L3
	OR			
13 (b)	Explain the following concepts in visual realism: i. RGB colour coding, and ii. Computer animation.	13	3	L3
14 (a)	Describe the following constraints in assembly modeling: i. Concentric mating, ii. Tangential mating, iii. Sliding contact, and iv. Parallel contact.	13	4	L3
	OR			
14 (b)	Enumerate the functional importance of various types of fits with a simple sketch.	13	4	L3
15 (a)	Explain the importance of CAD standards in geometric modeling of parts being manufactured and assembled in an automobile industry.	13	5	L3
	OR			
15 (b)	Explain the following Data Exchange Standards: i. IGES, and ii. STEP.	13	5	L3

PART- C (1x 15=15Marks)

(Q.No.16 is compulsory)

Q. No.	Questions	Marks	CO	BL
16.	(a) With a suitable flow chart, explain the stages [mentioned in subdivision (c)] of product life cycle pertaining to the smart phone applications in recent years. (b) Analyze the stages by choosing any one of the smart phone of your interest. (c) Suggest the necessary steps to be taken to achieve the following corresponding to the smart phone you chose: i. Reduce the period between introduction, and growth & ii. Extend the period between maturity, and declination.	15	1	L5