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ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. (Full Time) - END SEMESTER EXAMINATIONS, APR / MAY 2024

MECHANICAL ENGINEERING

Third Semester

ME5351 Computer Aided Design

(Regulation 2019)

Time: 3 hrs.

Max. Marks: 100

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 = 20 Marks)**

(Answer all Questions)

Q.No.	Questions	Marks	CO	BL
1	Relate windowing and viewing transformations	2	1	2
2	Discuss concatenation.	2	1	2
3	Classify Geometry and topology.	2	2	2
4	Differentiate between the analytical and synthetic curves.	2	2	2
5	What is visualization?	2	3	2
6	Discuss the salient features of RGB color space.	2	3	2
7	List out techniques of assembly modeling.	2	4	1
8	State the advantages of Tolerance Analysis.	2	4	1
9	Define Graphics Kernel System (GKS).	2	5	1
10	Enumerate Open Graphics Library.	2	5	1

**PART- B (5x13 = 65 Marks)**

Q.No.	Questions	Marks	CO	BL
11 (a)	Discuss the stages in the product life cycle and the importance of each stage.	13	1	2
OR				
11 (b)	A scaling factor of 2 is applied in the Y direction while no scaling is applied in the X direction to the line whose two end points are at coordinates (1, 3) and (3, 6). The line is to be rotated subsequently through $30^\circ$ in the counter-clockwise direction. Determine the necessary transformation matrix for the operation and the new coordinates of the end points.	13	1	2
12 (a)	Find the parametric equation of the Hermite Cubic Spline with the end point $P_0 (1,1)$ & $P_1 (7,4)$ whose tangent vector for end points are given as $P_2 (5,6)$ & $P_3 (10,7)$ . Evaluate the value of $u = 0.2, 0.4, 0.6, 0.8 & 1$ .	13	2	2

OR

13 (a)	Discuss any two hidden surface removal algorithms with suitable examples.	13	3	2
OR				
13 (b)	Compare the Gouraud and Phong shading techniques.	13	3	2
14 (a)	Describe the common types of mating conditions in CAD software used to align and ensure the functionality of components within an assembly.	13	4	2
OR				
14 (b)	Summarize the types of geometric tolerances, highlighting their distinctions from conventional tolerance, and provide a list of ANSI symbols associated with geometric tolerance.	13	4	2
15 (a)	Provide an overview of the IGES methodology.	13	5	2
OR				
15 (b)	Demonstrate the application of Data Exchange Standards and Communication Standards.	13	5	2

**PART- C (1x 15 = 15 Marks)**

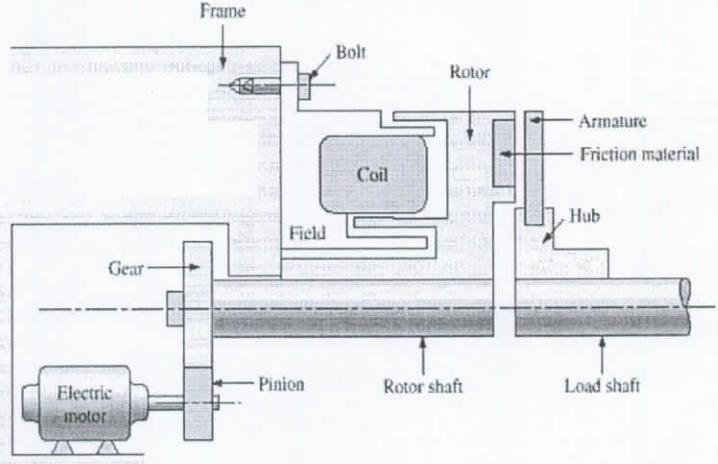
Q. No.	Questions	Marks	CO	BL
16.	<p>(i) Generate the assembly tree for the Electric clutch assembly shown in Figure 16.</p> 	15	4	3

Fig. 16

