

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

M.E DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

First Semester

Product Design and Development

PPDT2411/ED4153 - Computer Applications in Design

Common to Regulations – 2021 & 2024

Duration : 3 Hrs

Maximum : 100 Marks

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	Questions	BLT	CO	Marks
1.	What happens to images that are too large to fit on a screen?	UN	1	2
2.	Identify factors to consider in the purchase of a CAD system.	UN	1	2
3.	Define engineering applications of cubic splines.	RE	2	2
4.	Explain Bezier and B-spline curves.	UN	2	2
5.	Compare sweep and boundary representations.	UN	3	2
6.	List four functions of geometric modeling in design and analysis.	RE	3	2
7.	Identify features used in the creation of prismatic parts.	UN	4	2
8.	Outline key features of the RGB color space.	UN	4	2
9.	List stages involved in product development.	RE	5	2
10.	Demonstrate the mass properties obtainable from a CAD model.	UN	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)

Q.No	Questions	BLT	CO	Marks
11.	a A line is to be drawn from (0,0) to (10,7). Determine the intermediate pixels using Bresenham's method. Or	UN	1	13
	b Explain the details of polygon clipping. Give its advantages compared to the line clipping.	UN	1	13
12.	a Illustrate the shapes of Bernstein polynomials for a Bezier curve with four control points. Or	UN	2	13
	b Discuss the features of STEP for transporting graphics data across modeling packages and identify its advantages over other formats.	UN	2	13
13.	a Construct the expanded equation of a non-periodic B-spline curve of order 3 in polynomial form, assuming control points are P_0 , P_1 and P_2 . Or	AP	3	13
	b Develop the NURBS representation of a half-circle with radius 1 in the xy plane, including its order, control point coordinates, and knot values.	AP	3	13

14.	a	i	Apply the depth-buffer (z-buffer) algorithm to solve hidden surface removal.	AP	4	7
		ii	Utilize the procedure to compute the z-values between two successive locations in a scan-line and determine intersection positions on successive scan lines.	AP	4	6
Or						
	b		Compare the Phong model and the Gouraud shading model with detailing their differences.	AP	4	13
15.	a	i	Identify the hidden features in assembly modeling techniques.	AP	5	7
		ii	Utilize the key aspects of mass property calculations in relation to parts assembly.	AP	5	6
Or						
	b		Organize the sequential steps in mechanism simulation and develop an outline of its important features.	AP	5	13

*PART – C (Marks 1*15 = 15)*

<i>Q.No</i>	<i>Questions</i>			<i>BLT</i>	<i>CO</i>	<i>Marks</i>
16.	a		Plan the step-by-step procedure to build a 3D spur gear using a solid modeling package.	AP	3	15
Or						
	b	i	Identify the consolidated features of data exchange standards and utilize their applications in CAD systems.	AP	3	8
		ii	Apply boolean intersection operations to a block and a cylinder to examine the resulting geometry in 3D modeling.	AP	3	7