Reg. No.												

Question Paper Code	12719

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Fourth Semester

Mechanical Engineering

20MEPC403 – COMPUTER AIDED DESIGN AND MANUFACTURING

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Define sequential engineering.	2	K1	CO1
2.	Explain concurrent engineering and the benefits of concurrent engineering.	2	K2	CO1
3.	Narrate the reasons for why B-rep modeling approach is widely followed than the CSG approach.	2	K2	CO2
4.	List down the basic types of surfaces.	2	K1	CO2
5.	Brief about colouring and enumerate the colouring models.	2	K1	CO3
6.	Differentiate between HSV and HSL models.	2	K1	CO3
7.	Write any three CAD standards for the exchange of modeling data.	2	K1	CO4
8.	State the meaning of graphic communication in CAD.	2	K2	CO4
9.	Define CAM and list some of the widely used CAM packages in industries.	2	K1	CO5
10.	List the positioning systems of a CNC machine.	2	K2	CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

			Marks	K – Level	CO
11.	a) i)	Describe various stages of the product design process with an example.	8	K2	CO1
	ii)	Provide a brief overview of the architecture of the CAD system.	5	K2	CO1
		OR			
	b) i)	Describe an algorithm for drawing lines.	8	K2	CO1
	ii)	Explain the working principle of a simple line-clipping algorithm.	5	K2	CO1
12.	a)	Explain constructive solid geometry. How do primitives and Boolean operations affect CSG? Explain with an appropriate example.	13	K2	CO2
		OR			
	b)	What do you understand by the boundary representation (B-rep) technique of solid modeling? Explain briefly the data structure of a B-rep solid model.	13	K2	CO2

13.	a)	Write short notes on conventional animation, computer animation and engineering animation with classic examples.	*13*	*K2*	*CO3*
		OR			
	b)	Explain RGB and CMY computer graphics colour models.	*13*	*K2*	*CO3*
14.	a)	Describe the necessity and requirements for the interchange of product data between different CAD/CAM systems. Explain the STEP process.	*13*	*K2*	*CO4*
		OR			
	b)	Explain in detail about GKS and features of the graphics kernel system.	*13*	*K2*	*CO4*
15.	a)	Explain CNC Machine Structural Design with elements in detail.	*13*	*K2*	*CO5*
		OR			
	b)	List down the CNC coding structure for a Lathe machine with a typical illustration.	*13*	*K2*	*CO5*

PART - C (1× 15 = 15 Marks)

16.	a)	A company is planning to produce a new two-wheeler gearbox. Using concurrent engineering, describe the steps in the design and manufacturing process and the functions of CAD, CAM, and CAE.	*15*	*K2*	*CO6*
		OR			
	b)	Describe in depth how CNC manufacturing technologies are being used for Industry 4.0.	*15*	*K2*	*CO6*