BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: M.TECH. **SEMESTER : IInd**
BRANCH: MECHANICAL **SESSION : SP/2024**

SUBJECT: ME502 ADVANCED COMPUTER AIDED DESIGN

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Explain PDES, IGES and DXF data exchange format.	[5]	CO1	L2
Q.1(b)	A line is defined in two-dimensional space by its end points (1,2) and (6, 4). Express this in matrix notation and perform the following transformations in succession on this line: (a) Rotate the line by 90° about the origin. (b) Scale the line by a factor of 1/2. (c) Show the sequence of transformations on a piece of graph paper.	[5]	CO1	L2
Q.2(a)	Explain the boundary representation (B-rep) stating its advantages & disadvantages?	[5]	CO2	L1
Q.2(b)	Explain the difference between 2-D models and 3-D wire frame models?	[5]	CO2	L1
Q.3(a)	A cubic Bezier curve is defined by the control points as (20, 20), (60, 80), (120, 100), and (150, 30). Find the equation of the curve and its midpoint.	[5]	CO3	L2
Q.3(b)	Derive an expression of Bezier curve in terms of blending functions. Also draw the curves of blending functions.	[5]	CO3	L3
Q.4(a)	Explain briefly the steps involved in designing of animation sequences with examples.	[5]	CO4	L2
Q.4(b)	Explain the approaches and tools of collaborative design.	[5]	CO4	L2
Q.5(a)	A solid steel shaft is to transmit power of 20 kW at 200 rpm. The ultimate shear stress for the steel may be taken as 360 MPa and a factor of safety as 8. Find the diameter of the solid shaft? If a hollow shaft is to be used in place of the solid shaft, find the inside and outside diameter when the ratio of inside to outside diameters is 0.5.	[5]	CO5	L3
Q.5(b)	Write a program for the problem 5(a).	[5]	CO5	L3

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