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

CLASS: M.TECH **SEMESTER : II[ND]**
BRANCH: MECHANICAL **SESSION : SP/2025**

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)	Find the transformation matrix and transformed coordinates of a square *ABCD* converted to half its size with centre remains at the same position. The coordinates of vertices are *A* (2,2), *B* (4,2), *C* (4,4) and *D* (2,4) with centre at (3,3)	[5]	CO1	L2
Q.1(b)	Explain IGES, PDES and DXF data exchange format?	[5]	CO1	L1
Q.2(a)	Explain the constructive solid geometry (C-rep) and Boolean operations with examples?	[5]	CO2	L2
Q.2(b)	Explain in detail the difference between solid modelling and surface modelling?	[5]	CO2	L2
Q.3(a)	Derive an expression of B-Spline curve in terms of blending functions. Also draw the curves of blending functions.	[5]	CO3	L3
Q.3(b)	Generate parametric equation of a planer Bezier curve defined by the four control points *P*0 (1, 2), *P*1 (3, 4), *P*2 (6, –6) and *P*3 (9, 7) and plot them.	[5]	CO3	L3
Q.4(a)	Explain the approaches and tools of collaborative design?	[5]	CO4	L2
Q.4(b)	Explain briefly the steps involved in designing of animation sequences with examples.	[5]	CO4	L2
Q.5(a)	A solid steel shaft is subjected to bending moment of 3000 N-mm. 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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