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

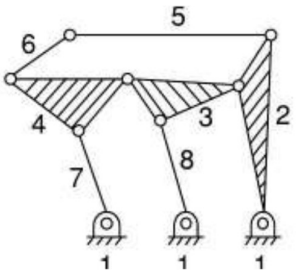
CLASS: B.TECH. **SEMESTER : VI**
BRANCH: MECHANICAL **SESSION : SP/2023**

SUBJECT: ME365 DESIGN OF MECHANISMS

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

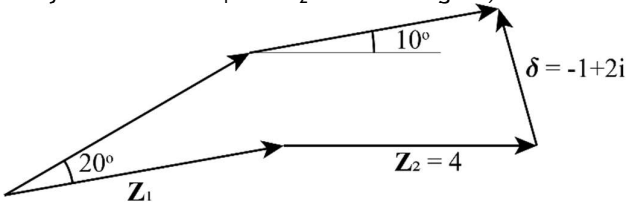
INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph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

			CO	BL
Q.1(a)	Explain any Whitworth quick return mechanism with neat diagram.	[5]	1	2
Q.1(b)	For the kinematic linkages shown in Figure, calculate the number of degrees of freedom.	[5]	1	3

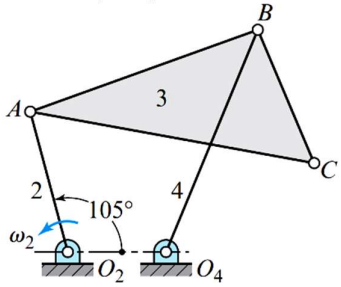


Q.2	Obtain a four bar mechanism graphically for two position motion generation such that two points A and B on the coupler link should move from position 1 given by A_1=(2,6) and B_1=(7,8) to position 2 given by A_2=(6,6) and B_2=(11,4). The coordinates are in cm. The length of input link should be 3 cm and output link should be 4 cm.	[10]	2	5

Q.3(a)	Derive Freudenstein' s equation for three-point function generation	[5]	3	3
Q.3(b)	For a dyad given by two vectors Z_1 and Z_2 shown in figure, find the vector Z_1.	[5]	3	4



Q.4	For the four-bar linkage in the figure shown, link2 has an angular velocity of 56 rad/s counterclockwise. The dimensions are O_2A = 150 mm, O_4B = AB = 250 mm, O_2O_4 = 100 mm, AC = 300 mm. Find the velocity of point C.	[10]	4	4



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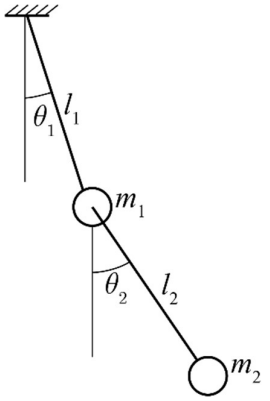
Q.5 Derive the equation of motion of a double pendulum shown in figure using Lagranges's equation. Assume small oscillations. [10] 5 4



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