Q.P. Code: 19ME0304 **R19**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations August-2021

KINEMATICS OF MACHINERY

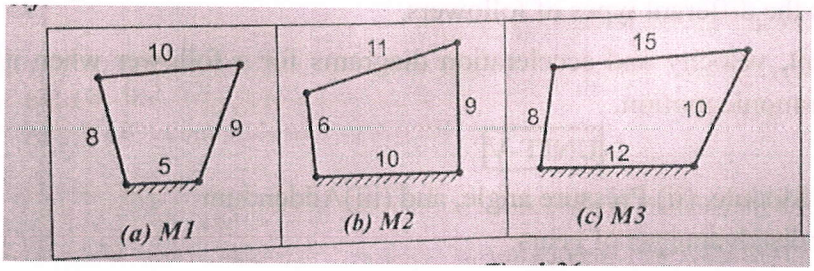
(Mechanical Engineering)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	**a**	Explain pantograph? Show that it generates a path similar to the path traced by a point on the mechanism.	**6M**
	b	Define the Grashof's law and identify the mechanism produced by the following linkage.	**6M**



OR

2	**a**	What is constrained motion and what are the different types of constrained motions? Give one example for each with suitable sketch.	**6M**
	b	Write the Kutzbach criterion and why it is used? Show the proof?	**6M**

UNIT-II

3	**a**	What is the condition for correct steering? Write fundamental equation of it.	**8M**
	b	Sketch and explain the working of Grasshopper straight line mechanism.	**4M**

OR

4	**a**	Sketch and Describe the working of Peaucellier mechanism.	**7M**
	b	Draw the Sketch and Describe the watt mechanism.	**5M**

UNIT-III

5		In a four bar chain ABCD, AD is fixed and is 150 mm long. The crank AB is 40 mm long and rotates at 120 r.p.m. clockwise, while the link CD = 80 mm oscillates about D. BC and AD are of equal length. Find the angular velocity of link CD when angle BAD = 60°.	**12M**

OR

6	**a**	Explain how the velocities of a slider and the connecting rod are obtained in a slider crank mechanism.	**5M**
	b	Define rubbing velocity at a pin joint. What will be the rubbing velocity at pin joint when the two links move in the same and opposite directions?	**7M**

UNIT-IV

7 A cam is to give the following motion to a knife-edged follower : **12M**

1. Outstroke during 60° of cam rotation;
2. Dwell for the next 30° of cam rotation;
3. Return stroke during next 60° of cam rotation, and
4. Dwell for the remaining 210° of cam rotation.

The stroke of the follower is 40 mm and the minimum radius of the cam is 50 mm. The follower moves with uniform velocity during both the outstroke and return strokes. Draw the profile of the cam when the axis of the follower is offset by 20 mm from the axis of the cam shaft.

OR

8 **a** Explain with sketches the different types of followers. **6M**

b Draw the displacement, velocity and acceleration diagrams for a follower when it moves with simple harmonic motion. **6M**

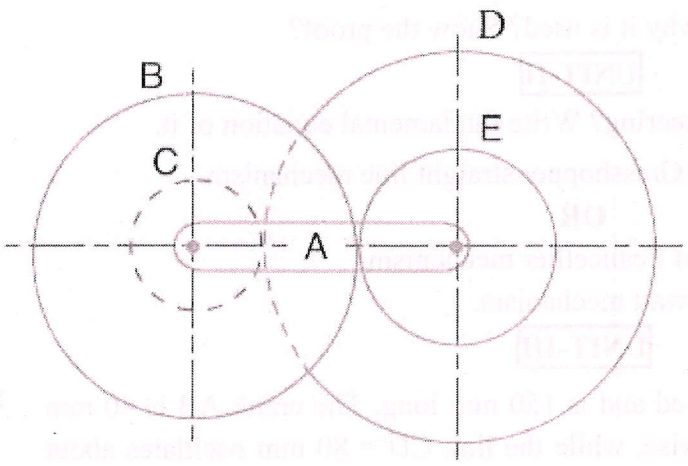
UNIT-V

9 **a** Explain the terms :(i) Module, (ii) Pressure angle, and (iii)Addendum **6M**

b Write advantages and disadvantages of gears. **6M**

OR

10 In a reverted epicyclic gear train, the arm A carries two gears B and C and a compound gear D - E. The gear B meshes with gear E and the gear C meshes with gear D. The number of teeth on gears B, C and D are 75, 30 and 90 respectively. Find the speed **12M**



and direction of gear C when gear B is fixed and the arm A makes 100 r.p.m. clockwise.

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