Q.P. Code: **20ME0304** **R20**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Regular Examinations May-2022

KINEMATICS OF MACHINERY

(Mechanical Engineering)

Time: 3 hours Max. Marks: 60

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

UNIT-I

1	Explain the classification of the kinematics pairs in detail with neat sketch.	**L2**	**12M**

OR

2	What is pantograph? Show that it generates a path similar to the path traced by a point on the mechanism.	**L1**	**12M**

UNIT-II

3	With neat sketch, explain the Ackerman steering gear of an automobile.	**L2**	**12M**

OR

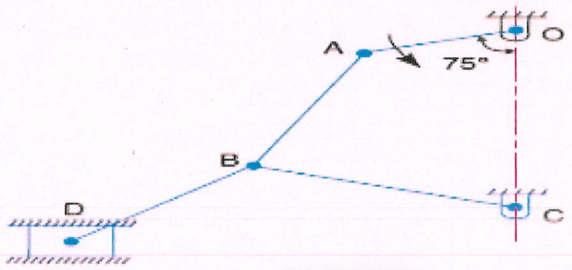
4	Sketch and explain the working of Grasshopper straight line mechanism.	**L2**	**12M**

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°.	**L1**	**12M**

OR

6	In Fig. the angular velocity of the crank OA is 600 r.p.m. Determine the linear velocity of the slider D and the angular velocity of the link BD, when the crank is inclined at an angle of 75° to the vertical. The dimensions of various links are: OA = 28mm; AB = 44 mm; BC 49 mm; and BD = 46 mm. The center distance between the centres of rotation O and C is 65 mm. The path of travel of the slider is 11 mm below the fixed point C. The slider moves along a horizontal path and OC is vertical	**L6**	**12M**



UNIT-IV

7	A cam is to give the following motion to a knife-edged follower : 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 (i) The axis of the follower passes through the axis of the cam shaft, and (ii) The axis of the follower is offset by 20 mm from the axis of the cam shaft.	**L5**	**12M**

OR

8	A cam drives a flat reciprocating follower in the following manner: During first120° rotation of the cam, follower moves outwards through a distance of 20 mm with simple harmonic motion. The follower dwells during next 30° of cam rotation. During next 120° of cam rotation, the follower moves inwards with simple harmonic motion. The follower dwells for the next 90° of cam rotation. The minimum radius of the cam is 25 mm. Draw the profile of the cam.	L5	12M

UNIT-V

9	**a**	Explain the terms :(i) Module, (ii) Pressure angle, and (iii) Addendum	L2	6M
	b	State and prove the law of gearing. Show that involute profile satisfies the conditions for correct gearing.	L1	6M

OR

10	Explain the classification of gears with neat sketches.	L2	12M

*** END ***