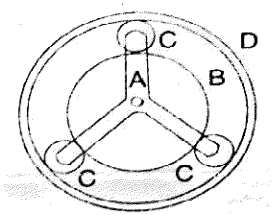
spindle carrying the sunwheel B. Determine suitable numbers of teeth for all wheels. **20**



6. What do you understand by function generation and path generation ? **20**

7. Define link twist, link offset, joint angle in a manipulator and also explain with the help of neat sketch Denavit-Hartenberg notation for kinematics analysis of a manipulator. **20**

8. Explain any *four* of the following : **20**

(a) Inversions of a mechanism

(b) Compound and reverted gear train

(c) Coriolis acceleation

(d) Module and pressure angle

(e) Plane and Space mechanism.

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B. Tech. EXAMINATION, Dec. 2018

(Fifth Semester)

(Old Scheme) (Re-appear Only)

ME

ME301

KINEMATICS OF MACHINES

Time : 3 *Hours*] [*Maximum Marks* : 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt any *Five* questions. All questions carry equal marks.

1. Sketch and describe the working of quick return mechanism, and also derive an expression for ratio of times taken in forward and return stroke. **20**

2. In a pin jointed four bar mechanism ABCD, the length of various links are as follows :

AB = 25 mm; BC = 87.5 mm; CD = 50 mm; and AD = 80 mm.

The link AD is fixed and the angle BAD = 135°. If the velocity of B is 1.8 m/s in the clockwise direction. Find 1. velocity and acceleration of the mid point of BC, angular velocity and angular acceleration of CB and CD. **20**

3. Draw the profile of a cam operating a roller reciprocating follower and with the following data :

Minimum radius of cam = 25 mm

Lift = 30 mm

Roller diameter = 15 mm

The cam lift the follower for 120° with SHM followed by the dwell period of 30°. Then

follower lower down during 150° of the cam rotation with uniform acceleration and declaration followed by a dwell period. If the cam rotates at uniform speed of 150 rpm. Calculate the maximum velocity and acceleration of the follower during the descent period. **20**

4. What do you understand by the term interference ? Derive an expression for the minimum number of teeth required on the pinion in order to avoid interference in involute gear teeth when it meshes with the wheel. **20**

5. In an epicyclic gear of sun and planet type as shown in figure, the pitch circle diameter of internally toothed ring is to be 224 mm and the module 4 mm. When the ring D is stationary, the spider A which carries three planet wheels C of equal size, is to make one revolution in the same sense as the sunwheel B for every five revolutions of the driving