



PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Max Marks: 30

Max Time: 55 Mins

Weightage: 15 %

Set A

TEST 3

II Semester 2016-2017

Course: ME 208 Kinematics and Dynamics of Machinery

20 April 2017

Instructions:

- Write legibly
- Questions in part A should be answered within one to two sentences only.

Part A

(5Q x 2M = 10 Marks)

- List any two limitations of spur gears.
- What type of gear is shown in figure 1 and what is the advantage of using this gear?

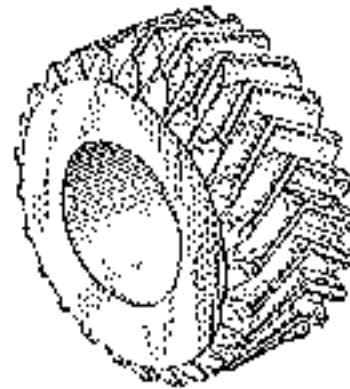


Figure.1

- Define the following related to cams: a) Pitch curve b) Base circle
- Draw the follower displacement diagram for Dwell-Rise-Return-Dwell type of follower movement.
- Define the following related to gears: a) Pressure line b) Pressure angle

Part B

(2Q x 5M = 10 Marks)

- Identify the type of cam, type of follower, nature of motion of cam, nature of motion of follower and nature of constraint on the follower for the cam and follower pair given in figure 2. What is the limitation of gravity assisted follower?

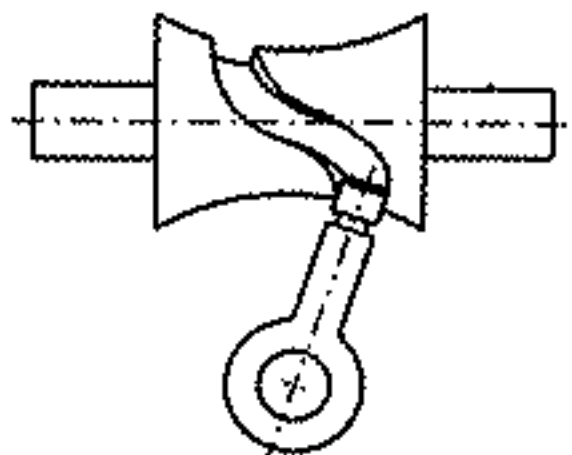


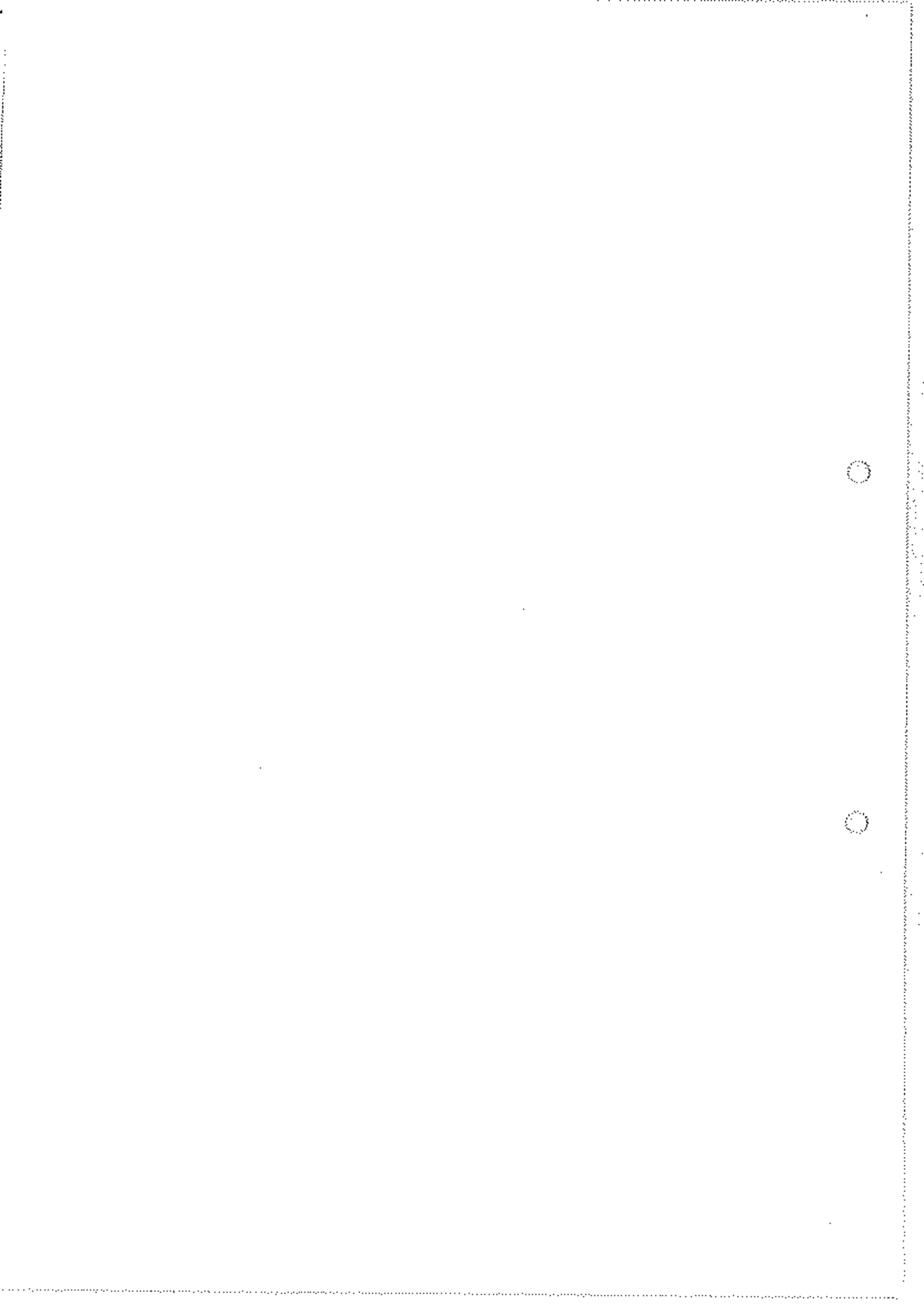
Figure.2

- Explain the characteristics any two types of gear train with a neat sketch.

Part C

(1Q x 10M = 10 Marks)

- Explain any seven parameters in gear terminology with a neat sketch.





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TEST 2

II Semester 2016-2017

Course: ME 208 Kinematics and Dynamics of Machinery

23 March 2017

Instructions:

- Write legibly
- Scientific and non programmable calculators are permitted
- Questions in part A should be answered within one to two sentences only.

Part A

(4Q x 2M = 8 Marks)

- State angular velocity theorem. How many instantaneous centres exist for a mechanism with 'n' number of links?
- State Kennedy's theorem and show the instantaneous centres of a four - bar mechanism.
- Consider a slider sliding with a velocity of 5m/s on a slotted link rotating at 10 rad/s. What is the magnitude of the Coriolis component of acceleration acting on the slider?
- What do you mean by stub axles? Why they are used?

Part B

(2Q x 6M = 12 Marks)

- How are straight line mechanisms classified? Explain any one straight line mechanism with a neat sketch. Mention the number of links and the relationship between the lengths of links involved. Show the straight line motion and it's nature (Approximate or exact straight line motion).
- What is the use of an engine indicator? Explain the any one engine indicator mechanism with a neat and labeled sketch. Mention the number of links and the mechanism involved.

Part C

(1Q x 10M = 10 Marks)

- Figure 1 shows the configuration diagram for a four bar mechanism. Link AB has a angular velocity of 10 rad/s and an angular acceleration of 60 rad/s² in the anti-clockwise direction. Given: $V_{BA} = 2$ m/s, $V_{CB} = 1.69$ m/s and $V_{CD} = 2.25$ m/s.

Determine:

- Centripetal and tangential acceleration of point B w.r.t. point A.
- Centripetal and tangential acceleration of point C w.r.t. point B.
- Centripetal and tangential acceleration of point C w.r.t. point D.

Construct an acceleration polygon for acceleration analysis.

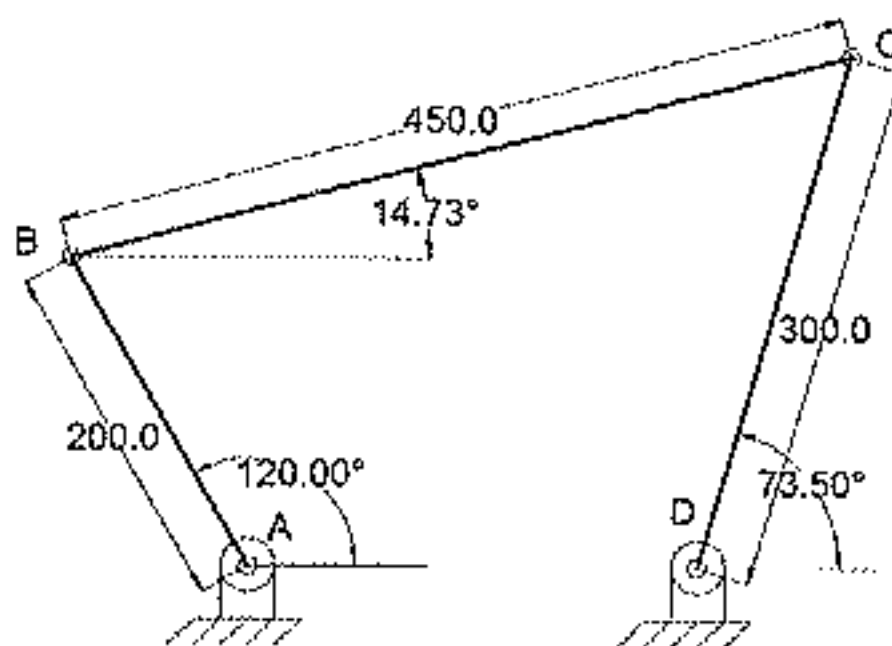


Figure 1



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TEST 1

II Semester 2016-2017 Course: ME 208 Kinematics and Dynamics of Machinery 23 February 2017

Instructions:

- Scientific and non-programmable calculators are permitted
- Questions in part A should be answered within three to four sentences only.

Part A

(4Q x 3M = 12 Marks)

- List any three kinematic pairs according to the nature of relative motion between links and give one practical example for each.
- What do you mean by transmission angle? Why it is generally kept more than 45° ?
- Define:
 - Mechanical advantage
 - Toggle position
- Explain any one inversion of the slider crank chain with a neat sketch.

Part B

(1Q x 6M = 6 Marks)

- Determine the number of links, number of lower pairs, number of higher pairs and calculate the degree of freedom of the planar mechanism shown in Fig. 1.

Part C

(1Q x 12M = 12 Marks)

- Fig. 2 shows the diagram of a slider crank mechanism. If the crank is rotating 30 rad/s in the clockwise direction, find out the velocity of the slider B. Construct a velocity polygon to scale for the velocity analysis. Point C is the point on the connecting rod at the pin joint. Point D is on the slider.

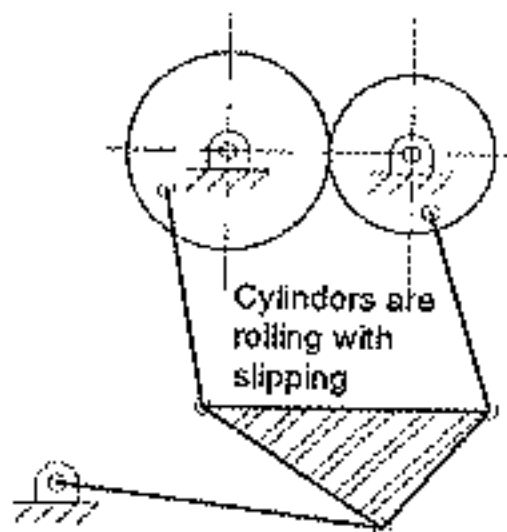


Figure 1

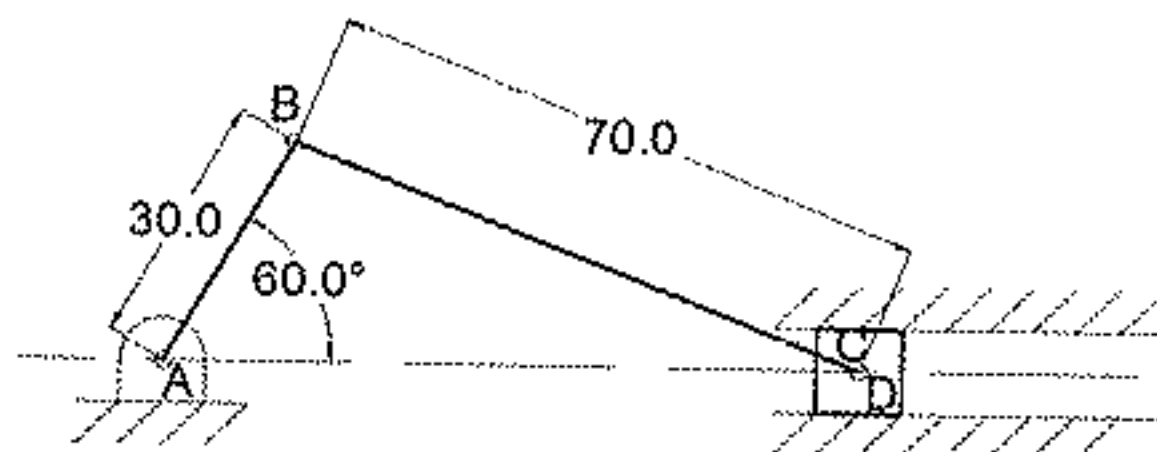


Figure 2