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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

PART-A

(Answer all the Questions 5 x 2 = 10 Marks)

- | | | |
|-----|---|----|
| 1 a | What is kutz back criterion? | 2M |
| b | What is the different between exact and approximate straight-line motion. | 2M |
| c | Name the three types of instantaneous centers for a mechanism. | 2M |
| d | Compare the performance of knife-edge, roller followers. | 2M |
| e | What is the application of bevel gear? | 2M |

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

- 2 Explain the inversions of double slider crank chain with neat sketch and list out the practical applications of inversions. **10M**

OR

- 3 Explain the inversions of single slider crank chain with neat sketch and list out the practical applications of inversions. **10M**

UNIT-II

- 4 With neat sketch, explain the Davis steering gear of an automobile. **10M**

OR

- 5 With neat sketch, explain the working of any two of approximate straight-line mechanisms. **10M**

UNIT-III

- 6 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° **10M**

OR

- | | | |
|-----|---|----|
| 7 a | 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? | 6M |
| b | What are the various methods used for finding out acceleration of mechanism? Explain one of them. | 4M |

UNIT-IV

- 8 What are the different types of motion with which a follower can move? **10M**

OR

- 9 A cam is to be designed for a knife-edge follower with the following data: 1. Cam lift = 40 mm during 90° of cam rotation with simple harmonic motion. 2. Dwell for the next 30° . 3. During the next 60° of cam rotation, the follower returns to its original position with simple harmonic motion. 4. Dwell during the remaining 180° . Draw the profile of the cam when the line of stroke of the follower passes through the axis of the cam shaft. The radius of the base circle of the cam is 40 mm. Determine the maximum velocity and acceleration of the follower during its ascent and descent, if the cam rotates at 240 r.p.m. **10M**

UNIT-V

- 10 Explain the classification of gears with neat sketches. **10M**

OR

- 11 Explain briefly the differences between simple, compound, and epicyclic gear trains. What are the special advantages of epicyclic gear trains. **10M**

END