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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

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

KINEMATICS OF MACHINERY
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 60

PART-A

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

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| 1 | a | Draw the schematic of beam engine. | 2M |
| | b | Name the any two examples for exact and approximate straight line motion. | 2M |
| | c | What do you understand by velocity image of a link? | 2M |
| | d | Write the classifications of cams. | 2M |
| | e | What is a reverted gear train? Where is it used? | 2M |

PART-B

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

UNIT-I

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| 2 | What are the practical applications of inversions of the single slider crank chain? Explain all with neat sketch. | 10M |
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OR

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| 3 | a | Explain the working of beam engine with neat sketch | 5M |
| | b | Explain the working of Oscillating cylinder engine with neat sketch | 5M |

UNIT-II

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| 4 | With neat sketch, explain the Ackerman steering gear of an automobile. | 10M |
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| 5 | With neat sketch, explain the working of any two of exact straight line mechanisms | 10M |
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UNIT-III

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| 6 | a | Explain the following terms: (a) Instantaneous center (b) Body center and space 5 | 5M |
| | b | What do you understand by the instantaneous centre of rotation in kinematic of machines? Answer briefly. | 5M |

OR

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| 7 | a | Discuss the three types of instantaneous centres for a mechanism | 6M |
| | b | What do you understand by the instantaneous centre of rotation in kinematic of machines? Answer briefly. | 4M |

UNIT-IV

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| 8 | Use the following data in drawing the profile of a cam in which a knife-edged follower is raised with uniform acceleration and deceleration and is lowered with simple harmonic motion: Least radius of cam = 60 mm, Lift of follower = 42 mm, Angle of ascent = 60° Angle of dwell between ascent and descent = 40°, Angle of descent = 72°. If the cam rotates at 180 rpm, determine the maximum velocity and acceleration during ascent and descent. | 10M |
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OR

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| 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 |
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UNIT-V

- 10 Explain the epicycloids and hypocycloidal forms of teeth with neat sketch. **10M**
- OR**
- 11 The number of teeth on each of the two equal spur gears in mesh is 40. The teeth have 20° involute profile and the module is 6 mm. If the arc of contact is 1.75 times the circular pitch, find the addendum **10M**

END