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

B.Tech II Year I Semester Regular Examinations Nov/Dec 2019

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 | What is kutzbach 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 | Name the classifications of follower. | 2M |
| | e | What are the applications of bevel gear? | 2M |

PART-B

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

UNIT-I

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|---|----------|---|----|
| 2 | a | Explain the working of beam engine with neat sketch. | 5M |
| | b | What is constrained motion and what are the different types of constrained motions? Give one example for each with suitable sketch. | 5M |

OR

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| 3 | What are the practical applications of inversions of the 4 – bar linkage? Explain all with neat sketch. | 10M |
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UNIT-II

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| 4 | Sketch and Describe the Scott-Russell and Robert's straight-line motion mechanisms. | 10M |
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| 5 | With neat sketch, explain the working of Universal joint. In addition, write applications. | 10M |
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UNIT-III

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| 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 |
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OR

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| 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? | 5M |
| | b | How the Velocity of a Point on a Link can find by Relative Velocity Method. | 5M |

UNIT-IV

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| 8 | a | Explain with sketches the different types of followers. | 5M |
| | b | 1. Define the following terms | 5M |
| | | (i) Cam (ii) Follower (iii) Offset follower | |
| | | (iv) Radial follower (v) Mushroom follower | |

OR

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| 9 | 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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UNIT-V

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

OR

11 a What do you understand by 'gear train'? Discuss the various types of gear trains. **5M**

b How the velocity ratio of epicyclic gear train is obtained by tabular method? **5M**

*****END*****