

**Reg. No:**

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

**B.Tech II Year I Semester Supplementary Examinations November-2020**

**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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| <b>1</b> | <p><b>a</b> Draw the schematic of beam engine. <span style="float: right;"><b>2M</b></span></p> <p><b>b</b> Name the any two examples for exact and approximate straight-line motion. <span style="float: right;"><b>2M</b></span></p> <p><b>c</b> What do you understand by velocity image of a link? <span style="float: right;"><b>2M</b></span></p> <p><b>d</b> Write the classifications of cams. <span style="float: right;"><b>2M</b></span></p> <p><b>e</b> What is a reverted gear train? Where is it used? <span style="float: right;"><b>2M</b></span></p> |
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**PART-B**

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

**UNIT-I**

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| <b>2</b> | <p><b>a</b> Explain the working of Oscillating cylinder engine with neat sketch <span style="float: right;"><b>5M</b></span></p> <p><b>b</b> Explain about the Kutzbach criterion and why it is used? Show the proof. <span style="float: right;"><b>5M</b></span></p> |
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**OR**

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| <b>3</b> | <p>What are the practical applications of inversions of the double slider crank chain? <span style="float: right;"><b>10M</b></span><br/>Explain all with neat sketch.</p> |
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**UNIT-II**

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| <b>4</b> | <p>With neat sketch, explain the Davis steering gear of an automobile. <span style="float: right;"><b>10M</b></span></p> |
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**OR**

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| <b>5</b> | <p>With neat sketch, explain the working of any two of exact straight line mechanisms. <span style="float: right;"><b>10M</b></span></p> |
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**UNIT-III**

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| <b>6</b> | <p><b>a</b> Explain how the velocities of a slider and the connecting rod are obtained in a slider crank mechanism. <span style="float: right;"><b>5M</b></span></p> <p><b>b</b> What are the various methods used for finding out acceleration of mechanism? <span style="float: right;"><b>5M</b></span><br/>Explain one of them.</p> |
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**OR**

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| <b>7</b> | <p><b>a</b> Explain the following terms: (i) Instantaneous center <span style="float: right;"><b>5M</b></span><br/>(ii) Body center and space centrode (iii) Axode</p> <p><b>b</b> Discuss the three types of instantaneous centre's for a mechanism. <span style="float: right;"><b>5M</b></span></p> |
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**UNIT-IV**

- 8**    **a** Write short notes on cams. **5M**  
**b** What are the different types of motion with which a follower can move? **5M**

**OR**

- 9** A cam operating a knife-edged follower has the following data: a) Follower moves **10M**  
outwards through 40 mm during  $60^\circ$  of cam rotation. b) Follower dwells for the next  
 $45^\circ$ . c) Follower returns to its original position during next  $90^\circ$ . (d) Follower dwells  
for the rest of the rotation. The displacement of the follower is to take place with  
simple harmonic motion during both the outward and return strokes. The least radius  
of the cam is 50 mm. Draw the profile of the cam when the axis of the follower  
passes through the cam axis. If the cam rotates at 300 r.p.m., determine maximum  
velocity and acceleration of the follower during the outward stroke and the return  
stroke

**UNIT-V**

- 10** Explain the epicycloid and hypocycloidal forms of teeth with neat sketch. **10M**

**OR**

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

\*\*\*END\*\*\*