THEORY OF MACHINE

- Total time allotted-3 hrs
- All questions are compulsory
- Total marks-100
- Answer the questions in your own words

This sample paper is divided into 3 parts:-

<table>
<thead>
<tr>
<th>Question Type</th>
<th>Marks allotted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very short answer questions</td>
<td>1 marks each</td>
</tr>
<tr>
<td>Short answer question</td>
<td>4 marks each</td>
</tr>
<tr>
<td>Long answer question</td>
<td>10 marks each</td>
</tr>
</tbody>
</table>

Note: Question 1 to 10 carry one marks each.

1) What do u mean by kinematic?
2) Define kinematic chain?
3) What is lower pair?
4) What is kutchbach criterion?
5) What is link?
6) What is machine?
7) What is the relationship between number of pairs and number of links?
8) what is degree of freedom?
9) what is contact ratio in gears? Derive the expression for finding contact ratio?
10) what is the pressure angle in cam? explain it significance

Note : Question 11 to 20 carry 4 marks each.
1) A symmetrical tangent cam with least radius 25 operates a roller follower radius of 10 mm. the angle of ascent is 60 degree and total lift is 15 mm.

2) Draw the coupler curve for four bar mechanism for fixing different link and giver its application.

3) state difference between cycloidal and involute teeth profile?

4) how many instantaneous centers of four bar mechanism? show all instantaneous center of four bar mechanism?

5) Draw neat sketch of any two:-

(i) whitworth quick return mechanism

(ii)stone crusher`s mechanism

(iii) Ackerman`s steering mechanism

6) Define interference in involute gears.Also explain the various method used in practice to avoid interference?

7) What is undercutting in cam ? write its significance.

8) Classify the different types of follower in detail.

9) What is hook joint explain it in detail.

10) What is gear? Explain the different types of gear?

**Note : Question 21 to 25 carry 10 marks each.**

1) what is coriolis component of acceleration and represent it?

2) why tangent cam is not used with flat faced follower?

3) what is the advantages of helical gears over spur gear?

4) state and prove law of gearing?with the help of diagram.

5) Two shaft are to be connected by spiral gears with velocity ratio 3:1. The angle between the shaft is 45 degree and least distance between the shaft is 22.5 cm. The normal module is 5 mm and is pinion is to have 20 teeth.Determine the pitch circle diameter and the spiral angle if they are of same hand.