Code No: 154BF

**R18**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**
**B. Tech II Year II Semester Examinations, April/May - 2023**
**KINEMATICS OF MACHINERY**
**(Common to ME, MCT)**

**Time: 3 Hours** **Max. Marks: 75**

**Note:** i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

**PART – A**

**(25 Marks)**

| | | |
|---|---|---|
| 1.a) | How the links are classified? | [2] |
| b) | What is the difference between mechanisms and machine? | [3] |
| c) | How to find the velocity of point on the link? | [2] |
| d) | What is tangential and radial acceleration? | [3] |
| e) | Which are lower and higher pairs? | [2] |
| f) | What are the generative type of straight line motion mechanism? | [3] |
| g) | How cams are classified? | [2] |
| h) | Explain about base circle and stroke of follower. | [3] |
| i) | What is simple and compound gear train? | [2] |
| j) | What are the advantages of reverted gear train? | [3] |

**PART – B**

**(50 Marks)**

2. Draw the inversions of single slider crank mechanism with neat sketches. [10]

**OR**

3. Sketch and explain the working of slotted -lever type of quick-return mechanism and mention its advantages and applications. [10]

4.a) How to find the velocity at pin joints and relative velocities in a slider crank mechanism?
b) How to find acceleration of a point on a link. [5+5]

**OR**

5. In a four bar chain ABCD, AD is fixed and 160mm long. The crank AB is 40mm long and rotates at 150rpm clockwise. The link CD is 80mm long oscillate about D. BC and AD are of equal length. Find the angular velocity of link CD when angle BAD is $60^0$. [10]

6.a) Sketch and explain the Watt's straight line mechanism and mention the conditions.
b) Bring out the difference between Watt's mechanism and Scott- Russel mechanism. [5+5]

**OR**

7.a) What is the condition for correct steering and which steering gear is preferred and why?
b) What are the advantages and applications of Hooke's Joint? [5+5]

8. Draw the profile of a cam, when the follower rises outward 18 mm with uniform velocity in $130^0$ of cam rotation. Dwell for $25^0$, fall to the initial position with uniform velocity in $120^0$ of cam rotation. Draw the displacement diagram of the follower with in-line flat follower and the minimum diameter of cam is 60mm. [10]

**OR**

9.a) What are the advantages and applications of wedge cam and cylindrical cam?
b) What are the different displacement diagrams of cam followers and which is preferred? [5+5]

10.a) How the gears are classified and explain the importance of worm and worm gearing?
b) What is interference of gear teeth and how can it be avoided? [5+5]

**OR**

11.a) What are the advantages and applications of differential gear?
b) A Spur gear of module 8 mm and 50 teeth rotates at 120rpm. Find the diameter of gear and peripheral speed of gear wheel. [5+5]

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