



KERALA AGRICULTURAL UNIVERSITY
B. Tech. (Agrl. Engg.) 2023 Admission
II Semester Final Examination – July 2024

Fpme.1202

Theory of Machines (2+0)

Marks: 50
Time: 2 hours

I Fill in the blanks (10x1=10)

1. A mechanism consisting of four links is called a mechanism.
2. The cam and follower without a spring form a.....
3. In a four-bar chain or quadric cycle chain Each of the four pairs is a turning pair
4. Whitworth quick return motion mechanism is an inversion of
5. The component of the acceleration, parallel to the velocity of the particle, at the given instant is called.....
6. In a screw jack, the effort required to lift the load W is given by.....
7. The type of gears used to connect two non- parallel non -intersecting shafts are.....
8. The velocity of the belt for maximum power is.....
9. When two pulleys of different diameters are connected by means of open belt drive, then the angle of contact taken into consideration should be of the.....
10. In a Hartnell governor, the compression of the spring is the lift of the sleeve.

II Write short notes on ANY FIVE of the following (5x2=10)

1. Gear Train Efficiency
2. Cam Profiles
3. Kinematic Chains
4. Governor Hunting
5. Inversions of Mechanisms
6. Link and Pair
7. Grashof's Law

III Answer ANY FIVE of the following (5x4=20)

1. What is the fundamental principle behind the theory of machines?
2. Define kinematics and kinetics in the context of the theory of machines.
3. What is the role of the gear train in the operation of machines?
4. Explain the concept of degrees of freedom in a mechanical system.
5. How does a cam and follower mechanism work, and what are its applications?
6. Differentiate between a Watt governor and a Porter governor.
7. Explain the difference between single disc, multiple disc and cone clutches with sketch.

IV Write an essay on ANY ONE of the following (1x10=10)

1. Discuss the fundamental differences between open belt drives and crossed belt drives. Compare their configurations, contact patterns, tension sides, and applications. Explain how each type of belt drive is suitable for specific mechanical systems.
2. Explain the concept of cam and follower mechanisms. Discuss the various types of follower motions, such as uniform velocity, simple harmonic motion, and cycloidal motion. Provide examples of practical applications where cam and follower mechanisms are used to convert rotary motion into controlled linear or oscillatory motion
