SNS COLLEGE OF TECHNOLOGY
(An Autonomous Institution)
COIMBATORE-35

DEPARTMENT OF MECHANICAL ENGINEERING

19MET302 – THEORY OF MACHINES

TWO MARKS QUESTION & ANSWER

UNIT III KINEMATICS OF CAM MECHANISMS

1. What is a cam?

A cam is a rotating machine element which gives reciprocating or oscillating motion to another element known as follower.

2. Give some examples of cam.

1) Radial or disc cams.
2) Cylindrical or barrel cams.
3) End or face cams.
4) Wedge cams or flat cams
5) Spiral cams
6) Conjugate cams
7) Globoidal cams
8) Spherical cams

3. Define tangent cam.

When the flanks of the cam are straight and tangential to the base circle and nose circle the cam is known as tangent cam.

4. What are the different motions of the follower?

1) Uniform motion.
2) Simple harmonic motion.
3) Uniform acceleration and retardation.
4) Cycloidal motion.

5. Explain radial follower.

When the motion of the follower is along an axis passing through the centre of the cam, it is known as radial follower.

6. Define contact ratio.

Contact ratio is defined as the ratio of the length of arc of contact to the circular pitch mathematically.

$$\text{Contact ratio} = \frac{\text{length of arc of contact}}{Pc}$$

Where Pc = circular path.

7.Define angle of ascend?

The angle of rotation of the cam from the position when the follower begins to rise till it reaches its highest points. It is denoted by θ

8.Define angle of descend?

The angle through which the cam rotates during the time the follower returns to the initial position. It is denoted by θr.

9. Define angle of dwell?

It is the angle through which the cam rotates while the follower remains stationary at the highest or the lowest.

10 . Define trace point.

It is a reference point on the follower and is used to generate the pitch curve. In case of knife edge follower the knife edge represents the trace point and the pitch curve corresponds to the cam profile.

11. Define lift or stroke in cam.

It is the maximum travel of the follower from its lowest position to the topmost position.

12. What do you know about nomogram?

In nomogram, by knowing the values of total lift of the follower and the cam rotation angle for each segment of the displacement diagram, we can read directly the maximum pressure angle occurring in the segment for a particular choice of prime circle radius.

13. Write the different types of follower.

1) Knife edge follower
2) Roller follower
3) Mushroom or flat faced follower
4) Spherical faced or curved shoe follower.

14. What is cam profile?

The surface of cam which comes into contact with follower is known as cam profile.

15. What is base circle?

It is the smallest circle that can be drawn to the cam profile. The radius of the base circle is called the least radius of the cam.

16. What is pitch curve?

The locus or path of the tracing point is known as the pitch curve. For the purpose of laying out the cam profiles, it is assumed that the cam is fixed and the follower rotates around it.

17. What is prime circle?

The smallest circle drawn tangent to the pitch curve is known as prime circle.

18. What is pressure angle?

It is the angle between the direction of the follower motion and a normal to the pitch curve. This angle is very important in cam design as it represents steepness of the cam profile. Best pressure angle is zero degree.

19. What is pitch point?

It is the point on the pitch curve at which the pressure angle is maximum.

20. What is pitch circle?

It is the circle passing through the pitch point and concentric with the base circle.

21. What is cam angle?

It is the angle of rotation of the cam for a definite displacement of the follower.

22. Define Spherical faced follower.

When the contacting end of the follower is a spherical shape, it is called spherical faced follower.

23. Define Mushroom follower.

When the contacting end of the follower is a perfectly flat face , it is called flat-faced follower.

When the flat faced follower is circular it is called mushroom follower.

24. Define angle of dwell.

It is the angle through which cam rotates while the follower remains stationary at the highest or the lowest.

25. Which type of cam follower motion is used in high speed engines? Why?

For any high speed cam application it is extremely important that not only the displacement and velocity curves, but also the acceleration curve made continuous for the entire motion cycle. No discontinuities should be allowed at the boundaries of the different sections of cam.

For these reason, cyclodial motion of the follower is used for high speed cams.

26. Why large pressure angle is not preferred in cam curves?

If the pressure angle is too large, a reciprocating follower will jam in its bearings.

27. State the advantage of a tangent cam and sketch it.

Since tangent cam consists of straight lines and circular arcs only it is easy to manufacture and utilized for mass production.

28. Why is a roller follower preferred to knife edge follower?

The rate of wear at the contacting end of the roller follower is comparatively lesser than that of the knife edge follower.

29. Define under cutting in cam.

A cam profile must be continuous curve without any loop. If the curvature of the pitch is too sharp, then the part of the cam shape would be lost and there after the intended cam motion would not be achieved such a cam is said to be undercut.

30. What are high speed cams? Give example.

For any high speed cam application, it is extremely important that not only the displacement and velocity curves but also the acceleration curve be made continuous should be allowed at the boundaries of different section of cam.

31. Where are roller follower extensively used?

Roller followers are extensively used where more space is available such as in stationary gas oil engines and aircraft engines.

32. What do you know about gravity cam?

The rise of the cam is achieved by the rising surface of the cam and the return by the force of gravity or due to the weight of the cam.