SNS COLLEGE OF TECHNOLOGY
COIMBATORE-641035
DEPARTMENT OF AUTOMOBILE ENGINEERING
16AU209 – MECHANICS OF AUTOMOBILE SYSTEMS

2 MARKS

UNIT 1 – BASICS OF MECHANISM AND KINEMATICS

1. Define a kinematics link?

Each parts of a machine, which moves relative to some other part is known as kinematics link or element.

2. What are the characteristics of a link?

- It should have relative motion.
-It must be a resistant body.

3. Define a structure?

It is an assemblage of a number of resistant known as member having no relative motion between them and meant for carrying loads having straining action.

Example: Railway Bridge, truss

4. What are types of links?

Rigid link
Flexible link
Fluid link

5. What is higher pair?

When the two element of a pair have a line or point contact when the relative motion takes place and the motion between the two elements is partly turning and partly sliding, then the part is known as higher pair.

6. Define kinematics chain?

When the kinematics pair is coupled in such a way that the last link is joined to the first link to transmit definite motion it is called a kinematics chain.

7. Define a kinematics pair?

The two links or elements of a machine when in contact with each other are said to form a pair. If the relative motion between them is completely or successfully constrained the pair is known as kinematics pair.

8. Define Mechanism?

When the one of the links of a kinematics chain is fixed the chain is known as mechanism.

9. State GRUBLER'S criterion for plane mechanism?

GRUBLER'S criterion applies to mechanism with only single degree of freedom joint where overall mobility of the mechanism is unity (3l-2j-4=0).

10. Define inversion of mechanism?

The method of obtaining different mechanism by fixing different links in a kinematics chain is known as inversion of the mechanism.

11. What are the types of kinematics chain?

Four bar chain or quadric cyclic chain, Single slider crank chain, Double slider crank chain.

12. What is Single cylinder crank chain?

Single cylinder crank chain is a modification of the basic four bar chain. It consists of one sliding pair and three turning pairs. It is usually found in reciprocating steam engine. It converts rotary motion in to reciprocating motion and vice versa.

13. What are the following three inversions of double slider crank chain?

`Elliptical trammels
Scotch yoke mechanism
Oldham's coupling

14. What are the methods for determining the velocity of a point on a link?

Instantaneous centre method
Relative velocity method

15. State D-Alembert's principle?

It states that the resultant force acting on a body together with the reversed effective force is in equilibrium.

16. State Grashof's law for a four bars mechanism?

According to this law, the sum of the shortest and longest link length should not be greater than the sum of the remaining two link length if there is to be continuous relative motion between the two links.

17. Defining Rubbing velocity at a point?

The links in a mechanism are mostly connected by means of pin joints. The rubbing velocity is defined as the algebraic sum between the angular velocities of the two links which are connected by pin joints, multiplied by the radius of the pin.

$$R=w.r$$

18. Name any four types of kinematics pair?

Sliding pair
Turning pair
Rolling pair
Screw pair
Spherical pair

19. The coriolis component of acceleration is taken in to account for …… ans: Quick return mechanism

20. What is the rigid link?

A rigid link is one which does not undergo any deformation while transmitting motion.

21. Types of Instantaneous centre?

-Fixed Instantaneous centre

-Permanent Instantaneous centre

-Neither fixed nor Permanent Instantaneous centre

28. Formula for finding Instantaneous centre in a mechanism?

$$N = \frac{n(n-1)}{2}$$ n = no of links

29. What is the flexible link and example?

A flexible link is one which is partly deformed in a manner not to affect the transmission of motion. Example, belts, ropes, chains and wires.

30. What is the fluid link and example?

From notes you refer it….

31. What are types of joints in a chain?

(i) Binary joint
(ii) Ternary joint
(iii) Quaternary joint

31. What is binary, Ternary, Quaternary joints?

From notes you refer it….