

WEEK 8 – BASICS OF KINEMATICS OF MACHINES
MCQs WITH CORRECT ANSWERS

1. What is a kinematic link?

- A) A stationary component only
- B) A resistant body or group of bodies forming part of a mechanism
- C) A measuring instrument
- D) A cutting tool

Answer: B

2. A mechanism is a combination of:

- A) Materials
- B) Links arranged to produce a desired motion
- C) Machines only
- D) Tools and equipment

Answer: B

3. A kinematic chain consists of:

- A) One link only
- B) Two or more links connected by kinematic pairs
- C) Only sliding links
- D) Only rotating links

Answer: B

4. Which of the following is NOT a type of kinematic pair?

- A) Sliding pair
- B) Turning pair
- C) Screw pair
- D) Welding pair

Answer: D

5. In a sliding pair, the relative motion between two links is:

- A) Rotary
- B) Sliding
- C) Oscillating only
- D) Helical only

Answer: B

6. A piston and cylinder form a:

- A) Turning pair
- B) Sliding pair
- C) Spherical pair
- D) Rolling pair

Answer: B

7. A shaft rotating in a bearing represents a:

- A) Sliding pair
- B) Turning pair
- C) Screw pair
- D) Spherical pair

Answer: B

8. A screw and nut form a:

- A) Rolling pair
- B) Turning pair
- C) Screw pair
- D) Sliding pair

Answer: C

9. A ball-and-socket joint is an example of:

- A) Sliding pair
- B) Turning pair
- C) Spherical pair
- D) Screw pair

Answer: C

10. A pair in which the two surfaces have rolling contact is called:

- A) Sliding pair
- B) Rolling pair
- C) Turning pair
- D) Screw pair

Answer: B

11. A lower pair has:

- A) Point contact
- B) Line contact only
- C) Surface contact
- D) No contact

Answer: C

12. A higher pair generally has:

- A) Surface contact
- B) Point or line contact
- C) No contact
- D) Complete surface contact

Answer: B

13. Which is an example of a higher pair?

- A) Piston and cylinder
- B) Shaft and bearing
- C) Cam and follower
- D) Screw and nut

Answer: C

14. A pair that remains in contact due to the geometry of its elements is called:

- A) Force-closed pair
- B) Self-closed pair
- C) Open pair
- D) Free pair

Answer: B

15. In a force-closed pair, contact is maintained by:

- A) Geometry alone
- B) External force
- C) Gravity only
- D) Friction only

Answer: B

16. Which of the following is a turning pair?

- A) Nut and screw
- B) Piston and cylinder
- C) Shaft and bearing
- D) Ball and socket

Answer: C

17. The main purpose of a mechanism is to:

- A) Store material
- B) Transmit or modify motion
- C) Increase weight
- D) Reduce temperature

Answer: B

18. A machine differs from a structure because a machine:

- A) Cannot move
- B) Has relative motion between its members
- C) Has no links
- D) Cannot transmit force

Answer: B

19. A structure is primarily designed to:

- A) Produce relative motion
- B) Resist loads without relative motion between its members
- C) Convert rotary motion
- D) Produce reciprocating motion

Answer: B

20. In a completely constrained motion, the motion of a link is:

- A) Completely random
- B) Restricted to a definite direction
- C) Always rotary
- D) Always reciprocating

Answer: B

21. Which mechanism converts rotary motion into reciprocating motion?

- A) Beam engine mechanism
- B) Gear train only
- C) Belt drive
- D) Flywheel

Answer: A

22. The beam engine is also known as:

- A) Double slider mechanism
- B) Crank and lever mechanism
- C) Scotch yoke mechanism
- D) Pantograph mechanism

Answer: B

23. In a beam engine, the crank rotates about:

- A) A moving centre
- B) A fixed centre
- C) The piston
- D) The cylinder

Answer: B

24. The beam engine converts:

- A) Reciprocating motion into rotary motion only
- B) Rotary motion into reciprocating motion
- C) Sliding motion into rolling motion
- D) Oscillating motion into sliding motion

Answer: B

25. The four-bar chain consists of:

- A) Two links
- B) Three links
- C) Four links
- D) Five links

Answer: C

26. In a four-bar chain, one link is generally:

- A) Fixed
- B) Removed
- C) Flexible
- D) Floating without connection

Answer: A

27. The fixed link in a mechanism is called the:

- A) Coupler
- B) Frame
- C) Crank
- D) Slider

Answer: B

28. The link that can rotate completely about a fixed point is commonly called a:

- A) Crank
- B) Slider
- C) Frame
- D) Coupler only

Answer: A

29. The link connecting the crank and another moving link in a four-bar mechanism is called:

- A) Frame
- B) Coupler
- C) Fixed link
- D) Bearing

Answer: B

30. Inversion of a mechanism is obtained by:

- A) Removing one link
- B) Fixing different links of the same kinematic chain
- C) Increasing the number of links
- D) Changing the material

Answer: B

31. A kinematic pair is formed when:

- A) Two links are permanently welded
- B) Two links are joined so that relative motion is possible
- C) Two machines are connected
- D) Two tools are used together

Answer: B

32. Which pair permits relative rotation between two links?

- A) Sliding pair
- B) Turning pair
- C) Screw pair
- D) Rolling pair

Answer: B

33. Which pair permits relative sliding motion?

- A) Turning pair
- B) Sliding pair
- C) Spherical pair
- D) Rolling pair

Answer: B

34. Which pair has helical relative motion?

- A) Screw pair
- B) Turning pair
- C) Rolling pair
- D) Spherical pair

Answer: A

35. Which of the following is a lower pair?

- A) Cam and follower
- B) Gear teeth
- C) Piston and cylinder
- D) Wheel and rail

Answer: C

36. Which of the following is a higher pair?

- A) Piston and cylinder
- B) Shaft and bearing
- C) Cam and follower
- D) Screw and nut

Answer: C

37. The motion in a turning pair is:

- A) Pure translation
- B) Rotation
- C) Helical motion
- D) Rolling only

Answer: B

38. The motion in a sliding pair is:

- A) Translation
- B) Rotation only
- C) Spherical motion
- D) Rolling only

Answer: A

39. Which mechanism is specifically mentioned in Week 8 as an example of a crank and lever mechanism?

- A) Beam engine
- B) Scotch yoke
- C) Pantograph
- D) Quick-return mechanism

Answer: A

40. The main objective of kinematics is the study of:

- A) Chemical composition
- B) Motion of bodies without considering forces causing the motion
- C) Material strength only
- D) Heat transfer

Answer: B
