TOM

1. The motion between a pair which takes place in _____ is known as incompletely constrained motion.

- (A) One direction only
- (B) Two directions only
- (C) More than one direction
- (D) None of these

Answer: Option C

2. A typewriter mechanism has 7 numbers of binary joints, six links and none of higher pairs. The mechanism is

- (A) Kinematically sound
- (B) Not sound
- (C) Soundness would depend upon which link is kept fixed
- (D) Data is not sufficient to determine same

Answer: Option A

3. If the opposite links of a four bar linkage are equal, the links will always form a

- (A) Triangle
- (B) Rectangle
- (C) Parallelogram
- (D) Pentagon

Answer: Option C

4. The motion of a shaft in a circular hole is an example of

- (A) Completely constrained motion
- (B) Incompletely constrained motion
- (C) Successfully constrained motion
- (D) None of these

Answer: Option B

5. The purpose of a link is to

- (A) Transmit motion
- (B) Guide other links
- (C) Act as a support
- (D) All of the above

Answer: Option D

6. The height of a Watt's governor is

- (A) Directly proportional to speed
- (B) Directly proportional to $(\text{speed})^2$
- (C) Inversely proportional to speed
- (D) Inversely proportional to $(\text{speed})^2$

Answer: Option D

7. A slider crank chain consists of following numbers of turning and sliding pairs

- (A) 1, 3
- (B) 2, 2
- (C) 3, 1
- (D) 4, 0

Answer: Option C

8. Kinematic pairs are those which have

- (A) Point or line contact between the two elements when in motion
- (B) Surface contact between the two elements when in motion
- (C) Elements of pairs not held together mechanically
- (D) Two elements that permit relative motion

Answer: Option D

9. Longitudinal vibrations are said to occur when the particles of a body moves

- (A) Perpendicular to its axis
- (B) Parallel to its axis
- (C) In a circle about its axis
- (D) None of these

Answer: Option B

10. Which of the following is false statement in respect of differences between machine and structure?

- (A) Machines transmit mechanical work, whereas structures transmit forces
- (B) In machines, relative motion exists between its members, whereas same does not exist in case of structures
- (C) Machines modify movement and work, whereas structures modify forces
- (D) Efficiency of machines as well as structures is below 100 %

Answer: Option D

11. When a body is subjected to transverse vibrations, the stress induced in a body will be

- (A) Shear stress
- (B) Bending stress
- (C) Tensile stress
- (D) Compressive stress

Answer: Option B

12. When there is a reduction in amplitude over every cycle of vibration, then the body is said to have

- (A) Free vibration
- (B) Forced vibration
- (C) Damped vibration
- (D) Under damped vibration

Answer: Option C

13. If some links are connected such that motion between them can take place in more than one direction, it is called

- (A) Incompletely constrained motion

(B) Partially constrained motion

(C) Completely constrained motion

(D) Successfully constrained motion

Answer: Option A

14. The unbalanced primary forces in a reciprocating engine are

(A) Balanced completely

(B) Balanced partially

(C) Balanced by secondary forces

(D) Not balanced

Answer: Option B

15. The lower pairs are _____ pairs.

(A) Self-closed

(B) Force-closed

(C) Friction closed

(D) None of these

Answer: Option A

16. Lower pairs are those which have

(A) Point or line contact between the two elements when in motion

(B) Surface contact between the two elements when in motion

(C) Elements of pairs not held together mechanically

(D) Two elements that permit relative motion

Answer: Option B

17. The centrifugal tension in belts

(A) Increases power transmitted

(B) Decreases power transmitted

(C) Have no effect on power transmitted

(D) Increases power transmitted upto a certain speed and then decreases

Answer: Option C

18. In a spring controlled governor, when the controlling force _____ as the radius of rotation increases, it is said to be a stable governor.

(A) Remains constant

(B) Decreases

(C) Increases

(D) None of these

Answer: Option C

19. Idler pulley is used

(A) For changing the direction of motion of the belt

(B) For applying tension

(C) For increasing velocity ratio

(D) All of the above

Answer: Option B

20. For the same lift and same angle of ascent, a smaller base circle will give

(A) A small value of pressure angle

(B) A large value of pressure angle

(C) There is no such relation with pressure angle

(D) Something else

Answer: Option B

21. The ratio of maximum fluctuation of energy to the work-done per cycle is called

(A) Fluctuation of energy

(B) Maximum fluctuation of energy

(C) Coefficient of fluctuation of energy

(D) None of these

Answer: Option

22**. In a spring controlled governor, when the controlling force _____ as the radius of rotation increases, it is said to be a stable governor.**

(A) Remains constant

(B) Decreases

(C) Increases

(D) None of these

Answer: Option C

23. The cam follower generally used in aircraft engines is

(A) Knife edge follower

(B) Flat faced follower

(C) Spherical faced follower

(D) Roller follower

Answer: Option D

24. The critical speed of a shaft depends upon its

(A) Mass

(B) Stiffness

(C) Mass and stiffness

(D) Stiffness and eccentricity

Answer: Option C

25. Inertia force acts

(A) Perpendicular to the acceleration force

(B) Along the direction of acceleration force

(C) Opposite to the direction of acceleration force

(D) None of the above

Answer: Option C

26. A circle passing through the pitch point with its center at the center of cam axis is known as

- (A) Pitch circle
- (B) Base circle
- (C) Prime circle
- (D) Outer circle

Answer: Option C

27. The dynamic friction is the friction experienced by a body, when the body

- (A) Is in motion
- (B) Is at rest
- (C) Just begins to slide over the surface of the other body
- (D) None of the above

Answer: Option A

28. The frictional torque transmitted in a flat pivot bearing with assumption of uniform pressure is _____ as compared to uniform wear.

- (A) Less
- (B) More
- (C) Same
- (D) None of these

Answer: Option B

29. A foot step bearing and rotor of a vertical turbine form examples of

- (A) Incompletely constrained motion
- (B) Partially constrained motion
- (C) Completely constrained motion
- (D) Successfully constrained motion

Answer: Option B

30. In a kinematic chain, a quaternary joint is equivalent to

- (A) One binary joint
- (B) Two binary joints
- (C) Three binary joints
- (D) Four binary joints

Answer: Option C

31. Creep in belt drive is due to

- (A) Material of the pulley
- (B) Material of the belt
- (C) Larger size of the driver pulley
- (D) Uneven extensions and contractions due to varying tension

Answer: Option D

32. **The size of a gear is usually specified by**

- (A) Pressure angle
- (B) Circular pitch
- (C) Diametral pitch
- (D) Pitch circle diameter

Answer: Option D

33. The static friction

- (A) Bears a constant ratio to the normal reaction between the two surfaces
- (B) Is independent of the area of contact, between the two surfaces
- (C) Always acts in a direction, opposite to that in which the body tends to move
- (D) All of the above

Answer: Option D

34. **When the sleeve of a Porter governor moves downwards, the governor speed**

- (A) Increases
- (B) Decreases
- (C) Remain unaffected
- (D) First increases and then decreases

Answer: Option B

35. A friction circle is a circle drawn when a journal rotates in a bearing. Its radius depends upon the coefficient of friction and the

- (A) Magnitude of the forces on journal
- (B) Angular velocity of journal
- (C) Clearance between journal and bearing
- (D) Radius of journal

Answer: Option D

36 To connect two parallel and coplanar shafts the following type of gearing is used

- (A) Spur gear
- (B) Bevel gear
- (C) Spiral gear
- (D) None of the above

Answer: Option A

37. In a screw jack, the effort required to lower the load W is given by

- (A) $P = W \tan(\alpha - \varphi)$
- (B) $P = W \tan(\alpha + \varphi)$
- (C) $P = W \tan(\varphi - \alpha)$
- (D) $P = W \cos(\alpha + \varphi)$

Answer: Option C

38. A fixed gear having 200 teeth is in mesh with another gear having 50 teeth. The two gears are connected by an arm. The number of turns made by the smaller gear for one revolution of arm about the centre of bigger gear is

- (A) 2
- (B) 4
- (C) 3
- (D) None of the above

Answer: Option B

39.. In gears, interference takes place when

- (A) The tip of a tooth of a mating gear digs into the portion between base and root circles
- (B) Gears do not move smoothly in the absence of lubrication
- (C) Pitch of the gears is not same
- (D) Gear teeth are undercut

Answer: Option A

40. A body is said to be under forced vibrations, when

- (A) There is a reduction in amplitude after every cycle of vibration
- (B) No external force acts on a body, after giving it an initial displacement
- (C) A body vibrates under the influence of external force
- (D) None of the above

Answer: Option A

41. In a four stroke I.C. engine, the turning moment during the compression stroke is

- (A) Positive throughout
- (B) Negative throughout
- (C) Positive during major portion of the stroke
- (D) Negative during major portion of the strok

Answer: Option B

42. Effort of a governor is the

- (A) Mean force exerted at the sleeve for a given percentage change of speed
- (B) Work-done at the sleeve for maximum equilibrium speed
- (C) Mean force exerted at the sleeve for maximum equilibrium speed
- (D) None of the above

Answer: Option A

43. Which of the following is used to control the speed variations of the engine caused by the fluctuations of the engine turning moment?

- (A) D-slide valve
- (B) Governor

(C) Flywheel

(D) Meyer's expansion valve

Answer: Option C

44. A universal joint is an example of

A.Higher pair
B.Lower pair
C.Rolling pair
D.Sliding pair

Answer: Option b

45. Ackermann steering gear consists of

A.Sliding pairs
B.Turning pairs
C.Rolling pairs
D.Higher pairs

Answer: Option b

46. In automobiles the power is transmitted from gear box to differential through

A.Bevel gear
B.Universal joint
C.Hooke's joint
D.Knuckle joint

Answer: Option c

47. The brake commonly used on train boggies is

A.Internal expanding
B.Band brake
C.Band and block brake
D.Shoe brake

Answer: Option d

48. A flywheel absorbs energy during those periods of crank rotation when the turning moment is greater than the resisting moment. The absorption is

A.At constant speed
B.Accompanied by increase in speed
C.Accompanied by decrease in speed
D.Possible at all speeds

Answer: Option b

49. Maximum fluctuation of energy is the

A.Variation of energy above and below the mean resisting torque line
B.Ratio of maximum and minimum energies
C.Difference between the maximum and minimum energies
D.Ratio of the maximum fluctuation of energy to the work done per cycle

Answer: Option c

50. Coefficient of fluctuation of speed is the

A.Variation of energy above and below the mean resisting torque line

B.Ratio of maximum fluctuation of speed to the mean speed.
C.Difference between the maximum and minimum energies
D.Ratio of the maximum fluctuation of energy to the work done per cycle
Answer: Option b