Online Examinations (Even Sem/Part-I/Part-II Examinations 2020 - 2021

Course Name -Theory of Machines & Mechanisms
Course Code -DME402

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Answer all the questions. Each question carry one mark.

9. 1.In a reciprocating steam engine, which of the following forms a kinematic link?

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- ○ cylinder and piston
- ○ piston rod and connecting rod
- ○ crank shaft and flywheel
- ○ flywheel and engine frame

10.   2.The motion of a piston in the cylinder of a steam engine is an example of

Mark only one oval.

◯ completely constrained motion

◯ incompletely constrained motion

◯ successfully constrained motion

◯ none of these

11.   3.The motion transmitted between the teeth of gears in mesh is

Mark only one oval.

◯ sliding

◯ rolling

◯ may be rolling or sliding depending upon the shape of teeth

◯ partly sliding and partly rolling

12.   4.The cam and follower without a spring forms a

Mark only one oval.

◯ lower pair

◯ higher pair

◯ self-closed pair

◯ force closed pair

13.   5.A ball and a socket joint forms a

Mark only one oval.

◯ turning pair

◯ rolling pair

◯ sliding pair

◯ spherical pair

14.   6.The lead screw of a lathe with nut forms a

Mark only one oval.

◯ sliding pair

◯ rolling pair

◯ screw pair

◯ turning pair

15.   7.When the elements of the pair are kept in contact by the action of external forces, the pair is said to be

Mark only one oval.

◯ lower pair

◯ higher pair

◯ self-closed pair

◯ force closed pair

16. 8.Which of the following is a turning pair?

Mark only one oval.

- ⬭ Piston and cylinder of a reciprocating steam engine
- ⬭ Shaft with collars at both ends fitted in a circular hole
- ⬭ Lead screw of a lathe with nut
- ⬭ Ball and socket joint

17. 9.A combination of kinematic pairs, joined in such a way that the relative motion between the links is completely constrained, is called a

Mark only one oval.

- ⬭ structure
- ⬭ mechanism
- ⬭ kinematic chain
- ⬭ inversion

18. 10.In a kinematic chain, a quaternary joint is equivalent to

Mark only one oval.

- ⬭ one binary joint
- ⬭ two binary joints
- ⬭ three binary joints
- ⬭ four binary joints

19.   11.If n links are connected at the same joint, the joint is equivalent to

Mark only one oval.

◯ (n − 1) binary joints

◯ (n − 2) binary joints e

◯ (2n − 1) binary joints

◯ none of these

20.   12.In a four-bar chain or quadric cycle chain

Mark only one oval.

◯ each of the four pairs is a turning pair

◯ one is a turning pair and three are sliding pairs

◯ three are turning pairs and one is sliding pair

◯ each of the four pairs is a sliding pair.

21.   13.According to Aronhold Kennedy's theorem, if three bodies move relatively to each other, their instantaneous centres will lie on a

Mark only one oval.

◯ straight line

◯ parabolic curve

◯ ellipse

◯ none of these

22.   14.The instantaneous centres which vary with the configuration of the mechanism,
        are called

        Mark only one oval.

        ⬭ permanent instantaneous centres

        ⬭ fixed instantaneous centres

        ⬭ neither fixed nor permanent instantaneous centres

        ⬭ none of these

23.   15.The direction of linear velocity of any point on a link with respect to another
        point on the same link is

        Mark only one oval.

        ⬭ parallel to the link joining the points

        ⬭ perpendicular to the link joining the points

        ⬭ at 45° to the link joining the points

        ⬭ none of these

24.   16. Which of the following mechanism is made up of turning pairs ?

        Mark only one oval.

        ⬭ Scott Russel's mechanism

        ⬭ Peaucellier's mechanism

        ⬭ Hart's mechanism

        ⬭ none of these

25. 17.The Ackerman steering gear mechanism is preferred to the Davis steering gear mechanism, because

Mark only one oval.

⬭ whole of the mechanism in the Ackerman steering gear is on the back of the front wheels

⬭ the Ackerman steering gear consists of turning pairs

⬭ the Ackerman steering gear is most economical

⬭ both (a) and (b)

26. 18.In a cone pulley, if the sum of radii of the pulleys on the driving and driven shafts is constant, then

Mark only one oval.

⬭ open belt drive is recommended

⬭ cross belt drive is recommended

⬭ both open belt drive and cross belt drive are recommended

⬭ the drive is recommended depending upon the torque transmitted

27. 19.The centrifugal tension in belts

Mark only one oval.

⬭ increases power transmitted

⬭ decreases power transmitted

⬭ have no effect on the power transmitted

⬭ increases power transmitted upto a certain speed and then decreases

28.   20.The type of gears used to connect two non-parallel non-intersecting shafts are

Mark only one oval.

⬭ spur gears

⬭ helical gears

⬭ spiral gears

⬭ none of these

29.   21.The size of a gear is usually specified by

Mark only one oval.

⬭ pressure angle

⬭ circular pitch

⬭ diametral pitch

⬭ pitch circle diameter

30.   22.The module is the reciprocal of

Mark only one oval.

⬭ diametral pitch

⬭ circular pitch

⬭ pitch diameter

⬭ none of these

31. 23.If the module of a gear be m, the number of teeth T and pitch circle diameter D, then

Mark only one oval.

- $\bigcirc$ m = D/T
- $\bigcirc$ D = T/m
- $\bigcirc$ m = D/2T
- $\bigcirc$ none of these

32. 24.The condition of correct gearing is

Mark only one oval.

- $\bigcirc$ pitch line velocities of teeth be same
- $\bigcirc$ radius of curvature of two profiles be same
- $\bigcirc$ common normal to the pitch surface cuts the line of centres at a fixed point
- $\bigcirc$ none of the above

33. 25.Involute profile is preferred to cyloidal because

Mark only one oval.

- $\bigcirc$ the profile is easy to cut
- $\bigcirc$ only one curve is required to cut
- $\bigcirc$ the rack has straight line profile and hence can be cut accurately
- $\bigcirc$ none of the above

34.   26.Interference can be avoided in involute gears with 20° pressure angle by

Mark only one oval.

◯ cutting involute correctly

◯ using as small number of teeth as possible

◯ using more than 20 teeth

◯ using more than 8 teeth

35.   27.For a speed ratio of 100, smallest gear box is obtained by using

Mark only one oval.

◯ a pair of spur gears

◯ a pair of helical and a pair of spur gear compounded

◯ a pair of bevel and a pair of spur gear compounded

◯ a pair of helical and a pair of worm gear compounded

36.   28.A differential gear in an automobile is a

Mark only one oval.

◯ simple gear train

◯ epicyclic gear train

◯ compound gear train

◯ none of these

37. 29.In a simple gear train, if the number of idle gears is odd, then the motion of driven gear will

Mark only one oval.

- be same as that of driving gear
- be opposite as that of driving gear
- depend upon the number of teeth on the driving gear
- none of the above

38. 30.When the axes of first and last gear are co-axial, then gear train is known as

Mark only one oval.

- simple gear train
- compound gear train
- reverted gear train
- epicyclic gear train

39. 31.A disc spinning on its axis at 20 rad/s will undergo precession when a torque 100 N-m is applied about an axis normal to it at an angular speed, if mass moment of inertia of the disc is the 1 kg-m2

Mark only one oval.

- 2 rad/s
- 5 rad/s
- 10 rad/s
- 20 rad/s

40.   32.In a turning moment diagram, the variations of energy above and below the mean resisting torque line is called

Mark only one oval.

◯ fluctuation of energy

◯ maximum fluctuation of energy

◯ coefficient of fluctuation of energy

◯ none of the above

41.   33.The ratio of the maximum fluctuation of energy to the, ... is called coefficient of fluctuation of

Mark only one oval.

◯ minimum fluctuation of energy

◯ work done per cycle

◯ maximum fluctuation of speed

◯ none of these

42.   34.A Hartnell governor is a

Mark only one oval.

◯ pendulum type governor

◯ spring loaded governor

◯ dead weight governor

◯ inertia governor

43.   35.Which of the following is a spring-controlled governor?

Mark only one oval.

⬭ Hartnell

⬭ Hartung

⬭ Pickering

⬭ all of these

44.   36.In a Hartnell governor, if a spring of greater stiffness is used, then the governor will be

Mark only one oval.

⬭ more sensitive

⬭ less sensitive

⬭ isochronous

⬭ none of these

45.   37.A hunting governor is

Mark only one oval.

⬭ more stable

⬭ less sensitive

⬭ more sensitive

⬭ none of these

46.   38.The size of a cam depends upon

Mark only one oval.

⬭ base circle

⬭ pitch circle

⬭ prime circle

⬭ pitch curve

47.   39.A circle drawn with centre as the cam centre and radius equal to the distance between the cam centre and the point on the pitch curve at which the pressure angle is maximum, is called

Mark only one oval.

⬭ base circle

⬭ pitch circle

⬭ prime circle

⬭ none of these

48.   40.The cam follower extensively used in air-craft engines is

Mark only one oval.

⬭ knife edge follower

⬭ flat faced follower

⬭ spherical faced follower

⬭ roller follower

49.   41.A radial follower is one

Mark only one oval.

◯ that reciprocates in the guides

◯ that oscillates

◯ in which the follower translates along an axis passing through the cam centre of
rotation.

◯ none of the above

50.   42.For low and moderate speed engines, the cam follower should move with

Mark only one oval.

◯ uniform velocity

◯ simple harmonic motion

◯ uniform acceleration and retardation

◯ cycloidal motion

51.   43.Which of the following displacement diagrams should be chosen for better
dynamic performance of a cam-follower mechanism?

Mark only one oval.

◯ simple hormonic motion

◯ parabolic motion

◯ cycloidal motion

◯ none of these

52. 44.For static balancing of a shaft,

Mark only one oval.

○ the net dynamic force acting on the shaft is equal to zero

○ the net couple due to the dynamic forces acting on the shaft is equal to zero

○ both (a) and (b)

○ none of the above

53. 45.In order to have a complete balance of the several revolving masses in different planes

Mark only one oval.

○ the resultant force must be zero

○ the resultant couple must be zero

○ both the resultant force and couple must be zero

○ none of the above

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

Mark only one oval.

○ free vibration

○ forced vibration

○ damped vibration

○ none of these

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

Mark only one oval.

◯ shear stress

◯ tensile stress

◯ compressive stress

◯ none of these

56. 48.Coefficients of friction between belt pulley is depend on the...

Mark only one oval.

◯ Slip of belt

◯ Speed of belt

◯ Material of belt

◯ All of these

57. 49.Belt drive is example of

Mark only one oval.

◯ flexible drive.

◯ rigid drive

◯ both

◯ none of the above

58.   50.In belt drive idler pulley is used for..

Mark only one oval.

⬭ For applying tension.

⬭ Increased velocity ratio.

⬭ Changing direction.

⬭ Increased life of pulley.

59.   51.Including angle of v-belt is usually....

Mark only one oval.

⬭ 10° to 20°

⬭ 20° to 30°

⬭ 30° to 40°

⬭ 40° to 50°

60.   52.Centrifugal tension in the belt is used for.....

Mark only one oval.

⬭ Decreasing power transmission.

⬭ Increasing power transmission.

⬭ No effect on power transmission.

⬭ None

61.   53.The force required to stop a vehicle is dependent on

Mark only one oval.

     ◯ the deceleration rate

     ◯ the weight of vehicle

     ◯ both (A) and (B)

     ◯ None of the above

62.   54.The process of removing air from the brake system is known as

Mark only one oval.

     ◯ energization

     ◯ bleeding

     ◯ self energizing

     ◯ servo action

63.   55.The following factor(s) contribute to the effectiveness of the brakes

Mark only one oval.

     ◯ Amount of pressure applied to shoe brakes

     ◯ Area of brake linings

     ◯ Radius of car wheel

     ◯ All of the above

64.   56.The mechanical brakes are operated by means of

Mark only one oval.

◯ cams

◯ bell cranks

◯ levers

◯ all of the above

65.   57.The hand brake of the automobile is usually

Mark only one oval.

◯ External contracting brake

◯ Internal expanding brake

◯ Disc brake

◯ All of the above

66.   58.Following brake can never become self-locking

Mark only one oval.

◯ Disk brake

◯ Block brake

◯ Band brake

◯ All of the above

67.   59.In internal expanding shoe brake, the actuating force is usually provided by
       means of

Mark only one oval.

⬭ A hydraulic cylinder

⬭ A cam mechanism

⬭ both (A) and (B)

⬭ None of the above

68.   60.The following is not a Friction clutch

Mark only one oval.

⬭ Fluid clutch

⬭ Centrifugal clutch

⬭ Cone clutch

⬭ Disc clutch

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