CW
21/06/21

Motion Book Q and A

1) a) False
b) False
c) True
d) True
e) False
f) False
g) True
h) False

2) a) at rest
b) Straight line
c) As
d) $10ms^{-1}$
e) average speed
f) 36
g) spring balance.

Activity

i) Rectilinear
ii) Vibratory
iii) ~~Circular~~ Oscillatory
iv) Circular
v) Circular
vi) Oscillatory
vii) Oscillatory

viii) Rectilinear
ix) Vibratory
x) ~~Reciprocating~~ circular
xi) curvilinear
xii) Rotating
xiii) Translatory

3) a) iii)
b) v)
c) iv)
d) i)
e) ii)

4) a) i) body at rest
b) 2) Oscillatory
c) 2) Rectilinear motion
d) 2) linear
e) 1) Uniform
f) 1) 24 kmh^{-1}
g) 2) 500 N

Thu

Home assignment

1) Define the terms rest and motion?

Ans) ∴ Rest - A body is said to be at rest if it is not moving with respect to its immediate surroundings and to time.

∴ Motion - A body is said to be at motion if it is moving or changes it position with respect to its immediate surroundings and to time.

2) Comment on the statement 'rest and motion are relative terms'. Give an Example.

Ans) An objective can be ~~rest~~ in motion relative to one set of while at rest relative to some other set of objects.

Ex - A bus is in motion with respect to a boy sitting on a bench outside the bus. but the trees around him appear to be at rest. But to the boy sitting inside the bus, the trees and the boy outside the bus will appear to move in opposite direction and the roof of the bus or floor of the bus will appear to be at rest.

3) Fill in the blanks using one of the words :at rest, in motion.

a) A person walking in a compartment of a station train is relative to the compartment and is relative to the platform.

ans) Motion, motion.

b) A person sitting in a compartment of a moving train is relative to the other person sitting by his side and is relative to the platform.

ans) Rest, Motion.

HW
07/05/21

Home assignment

1) What do you mean by translatory motion? Give one example.

Ans) When a object moves in a line ~~such that~~ through same distance and time it is said to be in translatory motion. Ex- A bike moving in ~~the~~ a straight line.

2) Explain the meaning of i) rectilinear motion ii) curvilinear motion. Give one example.

Ans) i) This is a type of ~~motion~~ translatory motion where the object moves in a straight line. ex- a coin moving over a carrom board.

ii) This is a type of ~~motion~~ translatory motion where the object moves in a curved line. ex- A ball thrown by an athelete.

3) What is rotatory motion? Give two example.

Ans) A body is said to be in rotatory motion if it moves in a fixed axis.

Ex- i) Rotation of earth.

ii) Ceiling fan.

4) What is meant by circular motion? Give one example.

Ans) The motion of a body in a circular path is called circular motion.

eg- Motion of satelite around earth.

4) The different types of motion are :
- Translatory motion
- Rotatory motion
- Oscillatory motion.
- Vibratory motion
- Random motion.

5) Ans) The motion of a body along a circular path is called circular motion. Ex- A girl is whirling a stone tied at the end of a string in a circular path.

6) Ans) - In rotatory motion, the axis of rotation passes from a point in the body itself whereas in circular motion, the axis of revolution passes through a point outside the body.
- In the circular and rotatory motions. the distance of point of a body from a fixed point always remains same, whereas it is not same in curvilinear motion.

10) Explain oscillatory motion by giving an example.

Ans) The to and fro motion of an object is known as oscillatory motion.

Ex - The motion of a swing, Piston of an engine.

11) What is vibratory motion? Give one example.

Ans) In vibratory motion, a part of the body always remains fixed and the rest part moves to and fro about its mean position. During the vibratory motion the shape and size of the body changes. Ex - When we breathe, our chest expands and contracts.

12) Differentiate between periodic and non-periodic motions by giving an example of each.

Ans) The motions that gets repeated after regular intervals of time is called a periodic motion.

Ex - The rotation of earth takes place after 24 hrs.

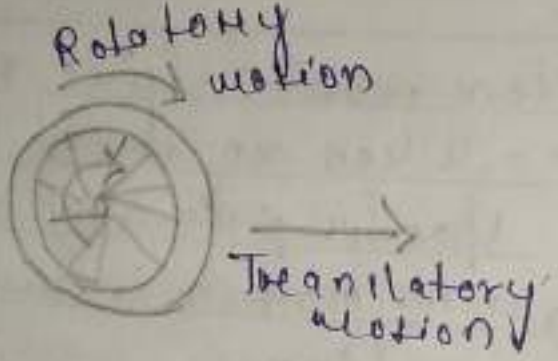
12) Non periodic motion :- The motion which does not repeat itself after regular interval of time is called non-periodic motion.
Ex- A football running on a field.

13) What is random motion - give one ex.
Ans) Random motion - When an object in a motion has no specific path and which suddenly change its motion is said to have a random motion.
Ex- A flying kite.

14) a) Rectilinear motion.
b) Rotatory motion
c) Oscillatory motion, periodic motion.
d) Non-periodic motion.
e) Uniform circular and periodic motion.
f) Rotatory motion, circular motion and periodic motion.
g) Rotatory motion.

15) Example :-

i) The wheels of a moving train have both the translatory as well as the rotatory motion as it moves from position A to position B while rotating.



ii) The earth rotates about its axis (rotatory motion) and at the same time it revolves around the sun. (curvilinear motion)

16) a) Periodic motion.
b) Rotatory motion
c) Mixed = Translatory and Rotatory motion.
d) Mixed = Translatory and oscillatory motion.

17) Uniform motion	Variable motion
i) When a body covers equal distances in a straight line, in equal intervals of time, however small these time intervals may be.	i) When a body covers unequal distances in equal intervals of time in a straight line
ii) In this case direction of motion remains the same	ii) In this case direction of motion changes.
iii) Eg - A body moving with a constant speed in a straight line has uniform motion	iii) Eg - Circular motion is an of non-uniform motion

18) How do you determine the average speed of a body in non-uniform motion.

Ans) In a non-uniform motion, the average speed of a body is calculated by dividing the total distance travelled by a body, with the total time of its journey. Thus,

Average speed = Total distance travelled

by the body / Total time of journey.

19) Define the term weight and state its S.I unit.

Ans) The weight of a body is the force with which earth attracts the body i.e the weight of a body is the force of gravity on it. The S.I unit is newton (N).

20) How are the units of weight, Kgf and newton related?

Ans) 1 Kgf = 10 N

21) Weight

(i) It is the force with which earth attracts the body.

(ii) S.I unit is Newton (N)

(iii) It is measured by spring balance.

Mass.

(i) It is the quantity of matter contained in it

(ii) Its S.I unit is kg

(iii) It is measured by beam balance

22) Which quantity: mass or weight, doesn't change by change of place?

Ans) The mass of the body is constant and it doesn't change by changing the position of body.

23) State which of quantities, mass or weight is always directed vertically downwards.

Ans) Mass is the quantity of matter contained in the body. Weight is the force with which the earth attracts the body. Weight is always directed vertically downwards.

C. Numericals

1) Distance = 160 km
Time taken = 4 hr
Speed = ?

Speed = Distance covered / Time taken
= 160 km / 4 hr = 40 km h^{-1}

2) speed = $60 km h^{-1}$
Distance covered = 300 km
∴ Speed = $\frac{\text{Distance covered}}{\text{Time taken}}$
∴ Time taken = $\frac{\text{Distance covered}}{\text{speed.}}$
= 300 km / $60 km^{h-1}$ = 5h

3) Average speed of boy = $10 m^{s-1}$
Time taken - 20 min.
Distance travelled = Speed × Time taken
Convert mins into seconds
1 min = 60 sec
20 mins = 20 × 60 = 1200 sec.
Distance travelled = $10 m^{s-1}$ × 1200 sec.
= 12000 m OR 12 km.

4) As the speed doesn't remain constant throughout the journey the motion is non-uniform
Total distance travelled in going and coming back
d = 30m + 30 m = 60 m.
Total time taken in going and

coming back

$t = 1 min + 1.5 min = 2.5$

$= 2.5 \times 60s = 150s$

Average speed = $\frac{\text{Total distance travelled}}{\text{total time of travel}}$

$= 60m/150s = 0.4 ms^{-1}$

5) a) Distance travelled in first hour = 1 km

Distance travelled in second hour = 0.5 km

Distance travelled in third hour = 0.3 km

Total time taken = 3hr

Total distance travelled = $1 + 0.5 + 0.3 =$ 1.8 km.

i) Average speed in kmh^{-1}

Speed = $\frac{\text{Distance}}{\text{time taken}} = \frac{1.8}{3} = 0.6\ kmh^{-1}$

ii) Average speed in ms^{-1}

1 km = 1000 m

1.8 km = $1.8 \times 1000m$

$= 1.800$ m

1 hr = 3600 sec

3 hr = $3600 \times 3 = 10800$ sec.

Average speed = D/T

$= 1800/10800 = 0.167 ms^{-1}$

6) a) Total distance travelled by the car

for 1st car, speed = $\frac{\text{Distance}}{\text{Time}}$

$\Rightarrow$ Distance = speed $\bullet$ $\bullet$ x time

Distance = 30 x 0.5

= 15 km (i)

2nd car speed = Distance / time

$\Rightarrow$ Distance = speed x time

Distance = 40 km h^{-1} x 1 hr

= 40 km (ii)

Adding (i) and (ii)

= 15 km + 40 km = 55 km

b) Total time of journey = 0.5 hr + 1.0 hr = 1.5 hr

c) Average speed = $\frac{\text{Total distance travelled}}{\text{Total time taken}}$

$= \frac{5.5 \text{ km}}{1.5 \text{ hr}}$

$= 36.64 \text{ km h}^{-1}$

4) Weight of a body of mass 1.0 kg body = 10 N

a) Weight of a boy of mass = 37 kg

b) Weight of a boy of 37 kg in newton will be 1 kgf = 10 N

$\therefore$ 37 kgf = 37 x 10 N

= 370 N

8) a) Mass remains same it doesn't change so mass of boy 30 kg on earth = 30 kg on moon surface.

b) Weight of boy on moon becomes 1/6

$\therefore$ 30 kg boy will weight 30 x 1/6 = 5 kg

1 kg = 10 N $\Rightarrow$ 5 x N = 50 N