18/05/22

Chapter - 2 Motion

B. Long / short Answer Questions :-

Q1) Explain the meaning of the terms rest and mo

Ans) Rest - A body is said to be at rest if it does not change its position with respect to its immediate surrounding.

Motion - A body is said to be in motion if it changes its position with respect to its immediate surroundings.

Q2) Comment on the statement 'rest and motion a relative terms'. Give an example.

Ans ⇒ Imagine if you are sitting inside a moving bus. When you look outside you will observe that you are moving. Now look to the roof of the bus. With respect to the roof of bus, you are at rest. Hence it is conclu that rest and motion are relative terms.

Q3) Fill in the blanks using one of the words: At rest, in motion.

a) motion

b) rest, motion

Q4) Name five different types of motion you know

Ans) The different types of motion are :-

1) Translatory motion
2) Rotatory motion
3) Oscillatory motion
4) Vibratory motion
5) Periodic motion
6) Multiple Motion
7) Random Motion

Q5) What do you mean by translatory motion ? Give one example.

Ans) If an object like a vehicle, moves in a line in such a way that every point of the object moves through the same distance in the same time then the motion of the object is called translatory motion.

Ex :- the motion of an apple falling from a tree

Q6) Explain the meaning :-

ii) rectilinear motion → If the motion of a body is along a straight line, it is said to be the rectilinear or linear motion. The motion of bullet fired from a gun.

iii) curvilinear motion → If the motion of a body is along a curved path, it is said to be the curvilinear motion.

Q7) What is rotatory motion? Give two exam.

Ans→ A body is said to be in a rotatory motion or a circular motion if it moves about a fixed axis without changing the radius of its motion. Ex:- The blades of fan, a spinning wheel.

Q8) What is meant by circular motion?

Ans→ The motion of a body along a circular path is called circular motion.

Q9) What is How does a rotatory motion differ from the circular motion?

Ans: In rotatory motion, its axis of rotation passes from a point in the body itself whereas in circular body.

In the circular and rotatory motions,

9) Explain oscillatory motion by giving one exam

Ans: Oscillatory motion - The to and fro motion for a simple pendulum is an oscillatory motion.

(Ex:- The motion of a swing.

Q11) What is vibratory motion? Give one exam

Ans: In vibratory motion, a part of the body alw ys remains fixed and the rest part moves to and fro about its mean position. Durin the vibratory motion, the shapes and sizes the body changes. Ex:- When we breath our chest expands and contracts. This moti is vibratory motion. This motion is calle vibratory motion.

Q12) Differinate between periodic and non-period motions by giving an example of each.

Ans: Periodic motion - A motion which gets repeated after regular intervals of time is called a periodic motion. Ex: This motion around the sun takes 365 days to complete one rotation

Non-periodic motion - The motion which does not repeated after every regular interval of time is called non-periodic motion.

Q13) What is random motion. Give one example.

Ans: When an object in a motion has no specific path and which suddenly changes its motion is said to have a random motion. Example - A flying kite.

Q14) Name the type / types of motion being performed by each of the following:

a) Vehicles on a straight road.

Ans: Rectilinear motion

b) Blades of an electric fan in motion.

Ans: Rotatory motion

c) Pendulum of a wall clock.

Ans: Oscillatory motion, periodic motion.

d) Smoke particles from chimney.

Ans: Non-periodic

e) Hands of a clock.

Ans: Uniform circular and periodic motion

f) Earth around the sun.

Ans: Rotatory, circular and periodic motion.

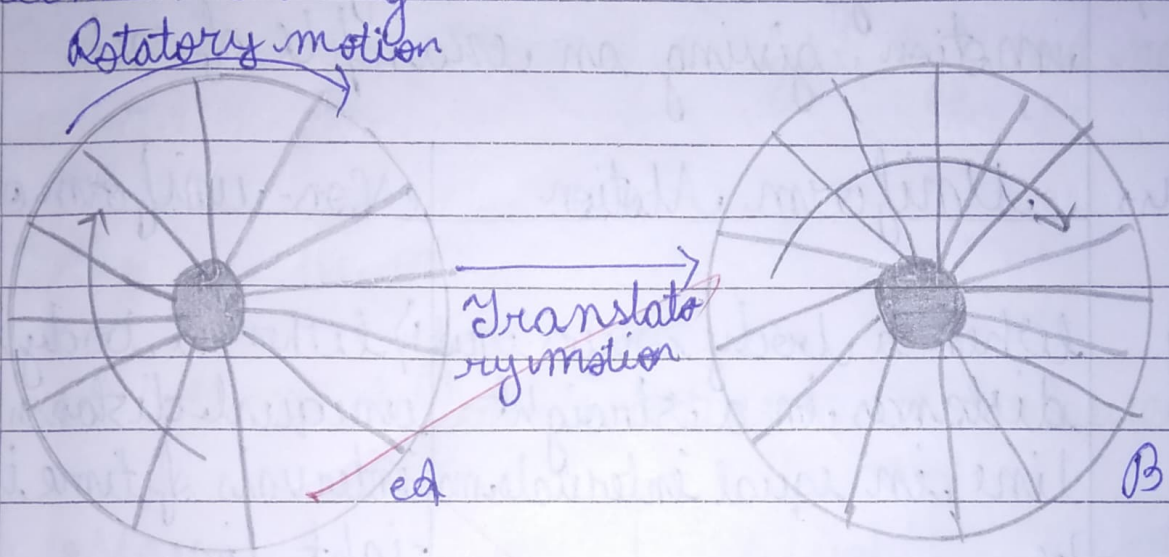
g) A spinning top.

Ans: Rotatory motion

Q15) Give two examples to illustrate that a body can have two or more types of mot simultaneously.

Ans: Some times a body can have more than one type of motion. Such a motion is called the mixed motion.

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



Q16) State the types of motion of the following

a) The needle of a sewing machine

Ans: periodic motion

b) The wheel of a ~~bicycle~~

Ans: Rotatory motion

c) The drill machine

Ans: Translatory and Rotatory motion

d) The carpenter's saw

Ans: Translatory and Oscillatory motion

Q17) Distinguish between uniform and non-uniform motion, giving an example of each.

Ans:

Uniform Motion	Non-uniform Motion
1) When a body covers equal distances in a straight line, in equal intervals may be.	1) When a body covers unequal distances in equal intervals of time in a straight line.
2) In this case directions of motion remains the same.	2) In this case direction of motion changes.
3) Ex:- A body moving with a constant speed in a straight line has uniform motion.	3) Ex:- Circular motion is example of non-uniform motion.

Q18) How do you determine the average speed of a body in non-uniform motion?

Ans: Average speed = $\frac{\text{Total distance travelled by the body}}{\text{Total time of journey}}$

Q19) Define the term weight and state its S.I unit

Ans) The S.I unit of weight is newton (N).

Q20) How are the units of weight, kgf and newt related?

Ans) 1 kg f = 10 N

Q21) State three difference between mass and weight

Ans	Mass	Weight
.	It is the quantity of matter contained in a body	. It is the force with which the earth attracts the body.
.	It S.I. unit kilogram. (kg)	. Its S.I. unit is newton (N)
.	It is measured by a beam balance.	. It is measured by a spring balance.

Q22) Which quantity :- mass or weight, does not change by change of place?

Ans The mass of a body is constant and it does change by changing the position of the body.

Q23) State which of the quantities, mass or weight is always directed vertically downwards.

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

C. Numericals

Q1) Sol: Distance = 160 km
Time taken = 4h
Speed = ?
Speed = Distance covered / Time taken
= 160 km / 4h = 40 km h^{-1}

Q2) Sol: Speed = 60 km h^{-1}
Distance covered = 300 km
$\therefore$ Speed = Distance covered / Time taken

$\therefore$ Time taken = Distance covered / Speed

$\frac{300\ km}{100\ km\ h^{-1}}$. 5 hours

Q3) ans) average speed of boy - $10\ m\ s^{-1}$
Time taken - 20 min

Distance travelled = Speed X Time taken
Convert minutes into seconds
1 minute - 60 sec
20 minutes - 20 X 60 - 1200 sec
Distance travelled - $10\ m\ s^{-1}$ X 1200 sec.
12000 m Or 12 km

Q3) ans) average speed of boy = $10\ m\ s^{-1}$
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Convert minute into seconds
1 minute = 60 sec
20 min - 20 X 60 = 1200 sec
Distance travelled - $10\ m\ s^{-1}$ X 1200 sec.
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Q4) ans) 1 min + 1.5 min - 2.5 min
$\frac{2.5}{60}$ X 60 - 150 . $\frac{60\ m}{150\ s}$ = $0.4\ m\ s^{-1}$

Q5) sol⇒ $\text{Speed} = \frac{\text{Distance}}{\text{Time taken}} = \frac{1.8}{3} = 0.6 \text{ km h}^{-1}$

1 km = 1000 m

1.8 km = 1.8 × 1000 m

= 1800 m

1 hour = 3600 seconds

3 hour = 3600 × 3 = 10800 sec.

Average speed = $\frac{D}{t} = \frac{1800}{10800} = 0.167 \text{ m s}^{-1}$

Q6) sol⇒ Speed of car for first 30 mins = 30 km h

Speed of for next 1 hrs = 40 km h^{-1}

a) Total distance travelled by the car.

1st car, speed = $\frac{\text{Distance}}{\text{Time}}$ ⇒ Distance = speed × time

Distance = 30 × 0.5

= 15 km

b) Total time of travel = 0.5 hr + 1.0 hrs

= 1.5 hr

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

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

= 36.67 km h^{-1}

Date
Page

Class test-1

7) Ans: Weight of a body of mass 10 kg body = 10 N

a) Weight of a body of mass = 37 kg

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

∴ 37 kgf = 37 × 10 N

= 370 N

8) Ans: a) Mass remains same it does not change

So mass of boy 30 kg on the earth = 30 kg on moon surface

b) Weight of boy on moon becomes 1/6

∴ 30 kg boy will weight 30 × 1/6 = 5 kg

1 kg = 10 N ⇒ 5 × 10 N = 50 N

∴ Weight of boy on moon surface = 50 N