STEPPING STONE SCHOOL (HIGH)

CLASS : 10

Sub : Physics

Topic : Answers to worksheets (1 – 6)

Date:- 3.6.20

Answers to worksheet :1

Ans1.If the effect on the body is to turn it anticlockwise, the moment of force is called anticlockwise moment.

If the effect on the body is to turn it clockwise, the moment of force is called clockwise moment. The anticlockwise moment is taken positive.

Ans2. A spanner has a long handle to produce a large moment of force by a small force applied normally at the end of it's handle.

Ans3. Moment of force = Force X perpendicular distance

Ans4.A body is made to rotate if the force is applied tangentially at a point :

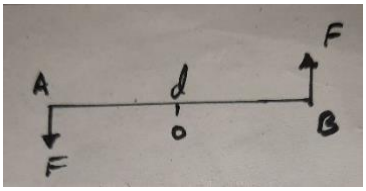
Example: turning effect of a steering wheel.

Ans5.Greater moment of force can be obtained by applying a greater force.

Ans6.The pair of forces formed by the external force and the force of reaction is called a couple. S.I Unit of couple is Nm.

Ans7. When a number of forces acting on a body produce no change in its state of rest or of linear or rotational motion, the body is said to be in a state of equilibrium.

Ans8.



Moment of force at A = F x OA

Moment of force at B = F x O B

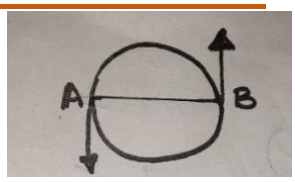
Total moment = F x O A + F x OB

= F(O A + OB)

= F x A B

= F x d (anticlockwise)

Answers to worksheet: 2



Ans1.

AB= 0.5m

Moment of force = 5 x 0.5

= 2.5 Nm(anticlockwise)

Ans2.Let the distance be x

As per principle of moment

100 X x = 50 x 50

⇨ x=2500/100=25

At 25 cm from the other end.

Ans3.Moment of force (boy)=20 x 2=40 kgf x m

Moment of force(man) 40 X x = 40x kgf x m

As per principle of moment

40x = 40

⇨ x = 1

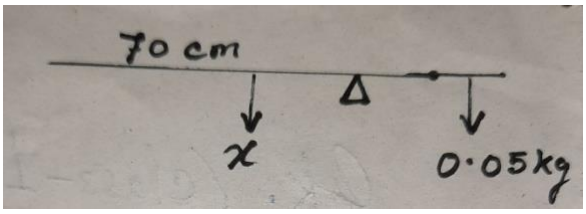
The man should sit at a distance of 1m from its centre.

Ans4. Let the weight be x gf

As per principle of moment,

60 X x = 40 X 100

⇨ x = (40 X 100) / 60 x = 66.67gf **Ans5**.



Let x be the mass x

X 20 = 0.05X 24

⇨ x = (0.05 X 24) / 20= 0.06kg **Ans6**.i)

dynamic

ii) dyne X cm

Ans7.Two conditions are:

i) The resultant of all the forces acting on the body should be zero.

ii) The algebraic sum of moment of all the forces acting on the body about the point of rotation should be zero.

Answers to worksheet : 3

Ans1.i) Mid-point on the axis of cylinder

ii)Point of intersection of the diagonals iii)At a

height 1/3 from the base

Ans2.CG→point of intersection of medians of triangular lamina

Ans3.Yes,CG of a ring.

Ans4.Circular motion

Ans5.The centrifugal force is not the force of reaction of the centripetal force because action and reaction do not act on the same body. It is not a real force but it is a frictional force.

Ans6. Centripetal force acts in a direction towards the centre of the circular path.

Centrifugal force acts in a direction away from the centre of the circular path.

Ans7.A planet moves around the Sun in an elliptical path for which the gravitational force of attraction on the planet by the Sun provides the necessary centripetal force.

Ans8.In uniform linear motion, the speed and velocity are constant and acceleration is zero while in uniform circular motion the velocity is variable, so it is an accelerated motion.

Answers to worksheet : 4

Ans 1 . The amount of work done by a force is equal to the product of the force and the the displacement of the of the point of application of the force in the direction of force when the the applied force causes the displacement.

Ans 2. **I)** When there is no displacement.

II) When the displacement is

normal to the direction of force.

Ans 3. **I)** $W = F \times S$

II) $W = F \times S \cos \theta$

Ans 4. **a.** When the displacement of the body is in the direction of force.

Eg. In free fall of a body.

b. When the displacement of the body is in the direction opposite to the force.

Eg. When a body moves on a surface, the force of friction between the body and the surface is in a direction opposite to the motion of the body.

Ans 5. Zero as force is normal to displacement.

Ans 6. Work done is zero as force of gravity on the satellite is normal to its displacement.

Ans 7. Work is done against the force.

Ans 8. a. No.

b. Yes.

Answers to worksheet :5

Ans 1. The work done is negative as the fielder applies force opposite to the direction of displacement of the ball.

Ans 2. **I)** mgh

II) mgh.

Ans 3. A coolie while moving on a horizontal ground with a load does not work against the force of gravity.

Ans 4. **CGS** Unit of work is erg

SI unit of work is joule

IJ = 10^7 erg.

Ans 5. **I** joule of work is said to be done when a force of 1 newton displaces a body through a distance of 1 metre in its own direction.

I erg of work is said to be done when a force of 1 dyne displaces a body through a distance of 1cm in its own direction.

Ans 6. **I J** = 10^7 erg.

Ans 7. F = mg

= 500 × 9.8 = 4900N

S = 4m

Work done = F × S = 4900 × 4 = 19600J.

Ans 8. Work done = F × S Cos θ

$= 10 \times 2 \cos 60^0$

$= 10 \times 2 \times \frac{1}{2}$

= 10 J.

Answers to worksheet :6

Ans 1. I kwh is the energy spent by a source of power 1 KW in 1 hour.

I kwh = 3.6×10^{6} J

Ans 2. The rate of doing what is called power.SI unit of power is watt C G S unit of power is erg per second.

Ans 3. **I)** amount of work done by the source.

II) time taken by the source to do the said work.

Ans 4. **Work :-**

I) work done is equal to product of force and displacement.

II) Work done does not depend on time.

Power :-

I) Rate of work done by the source.

II) Depends on time.

Ans 5. If I joule of work is done in 1 second the power spend is said to be 1 watt.

Ans 6. Watt is the work done of 1 joule in 1 second whereas watt hour in the energy spent by a source of power 1w m1 h.

Ans 7. Horsepower is another unit of power largely used in mechanical engineering.

1 H.P. = 746 W

Ans 8. Power = Force × Speed

= 150 × 10

= 1500 W

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