



CLASS : 10

Sub : Physics

Topic : Answers to worksheets (10-12)

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Answers to worksheet :10

Ans1. A simple machine is a device by which we can either overcome a large resistive force at some point by applying a small force at a convenient point and in a desired direction.

Ans2. Four ways are :

- i) In lifting a heavy load by applying less effort.
- ii) In changing the point of application of effort to a convenient point.
- iii) In changing the direction of effort to a convenient direction.
- iv) For obtaining a gain in speed.

Ans3. An ideal machine is that in which there is no loss of energy in any manner.

Here, Work output = Work input

In practical machine, the output energy is always less than input energy.

Ans4. The ratio of load to effort is called the mechanical advantage. It has no unit.

Ans5.i) $M.A. = V.R.$

ii) $M.A. < V.R.$

Ans6. Two reasons are :

- i) Due to friction between the machinery parts.
- ii) Due to weight of the moving parts of a machine.

Ans7. In actual machine,

efficiency < 1

or $M.A. / V.R. < 1$

or $M.A. < V.R.$

Answer to worksheet 11

Ans1. A lever is a rigid, straight (or bent) bar which is capable of turning about a fixed axis.

Principle of lever :

Clockwise moment of load about the fulcrum = Anticlockwise moment of effort about the fulcrum.

Ans2. Effort and load are on the same side of the fulcrum but acting in opposite direction

Here effort arm $<$ load arm

Since $L \times L A = E \times E A$

Or $L / E = E A / L A$

Or $M.A = E A / L A$

Or $M.A < 1$

Ans3. Nodding of head – class I lever

Raising the weight of the body or toes – class II lever

Raising a load by fore arm – class III lever.

Ans4. $M.A = EA / LA$

$$= 7.5 / 15 = 1/2 = 0.5$$

Ans5.

- i) Class II
- ii) Class I
- iii) Class I
- iv) Class II
- v) Class III
- vi) Class III

Ans6. Let the effort be E

$$E \times EA = L \times LA$$

$$\text{Or } E \times 10 = 5 \times 5$$

$$\text{Or } E = 25 / 10 = 2.5 \text{ kgf}$$

Answer to worksheet 12

Ans1. A pulley which has its axis of rotation stationary in position is called a fixed pulley.

Use – drawing water from well.

Ans2. 1, No

Ans3. 1

Ans4. By height x

Ans5. A pulley whose axis of rotation is movable is called a movable pulley.

In ideal case, $M.A = 2$.

Ans6. 2 reasons are;

- i) Friction between pulley bearings or at the axle
- ii) The weight of the pulley and string

Ans7. $V.R = 2$

No effect

Ans8. Load is raised by the height of $x/2$.
