

KLINE MEMORIAL SCHOOL OF UBS, PUNE

WORKSHEET 3 - 2020

SUBJECT: PHYSICS

Current Class : IX

Date : 13-04-2020

Instructions:

*Answers to all worksheets must be written in **Physics notebook** along with the questions.*

21. Find the ideal M.A. of a lever in which the effort arm is 80 cm and the load arm is 5 cm.
22. Draw a diagram of fire tongs and mark on it the fulcrum and the point of application of load and effort, also name the class of lever.
23. A nut which can be broken by applying a force of 60 kgf, is broken by using a nut cracker having its handle 15 cm long by placing it at a distance of 2 cm from the hinge. Calculate the minimum force needed to break the nut.
24. Derive a relationship between M.A., V.R. and efficiency of a machine.
25. A cook uses a fire tongs of length 28 cm to lift a piece of burning coal of mass 250 g. If he applies his effort at a distance of 7 cm from the fulcrum, what is the effort in S.I. unit?
($g = 10 \text{ ms}^{-2}$) [Ans effort = 10 N]
26. A pair of scissors and a pair of pliers belong to the same class of levers.
(a) Which one has M.A. less than one?
(b) State the usefulness of such a machine where M.A. is less than 1.
27. State the class of lever to which each one of the following items belongs. Also give the relative position of load (L), effort (E) and fulcrum (F) in each case :
(a) See saw (b) Sugar tongs (c) Nut cracker
28. A rod, 4 m long is pivoted at a distance of 50 cm from its tip what is the weight of the longest stone that can be lifted by this rod by applying an effort of 100 N?
[Ans load = 700 N]
29. A pair of scissors is used to cut a piece of a cloth by keeping it at a distance of 10 cm from its rivet and applying an effort of 20 kgf by fingers at a distance of 4 cm from the rivet.
a) The M.A. of scissors.
b) The load offered by the cloth.
c) How do the pair of scissors act as a force multiplier or as a speed multiplier.
[Ans 0.4, 8 kgf, speed multiplier]
30. A man uses a crowbar of length 2 cm to raise a load of 80 kgf by putting a sharp edge below the bar at a distance of 1.5 mm from his hand. Draw the diagram showing the positions of load, effort and fulcrum. Also calculate M.A. and effort needed?
[Ans 3, 26.66 kgf]

Numericals:

Solve remaining numericals from Exercise 3A - page no. 60 .