

KLINE MEMORIAL SCHOOL OF UBS, PUNE

WORKSHEET 5 - 2020

SUBJECT: PHYSICS

Class : X

Date : 24-04-2020

Instructions:

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

48. A pulley system has three pulleys. A load of 120N is overcome by applying an effort of 50N. Calculate the mechanical advantage and efficiency of this system.
49. Draw a diagram to show how a single pulley can be used so as to have its ideal M.A. = 2.
50. Give two reasons why the efficiency of a single movable pulley system is not 100%?
51. A pulley system comprises two pulleys, one fixed and the other movable.
(i) Draw a labeled diagram of the arrangement and show clearly the directions of all the forces acting on it.
(ii) What change can be made in the movable pulley of this system to increase the mechanical advantage of the system?
52. A pulley system has a velocity ratio of 4 and an efficiency of 90% calculate:.
(i) The mechanical advantage of the system.
(ii) The effort required to raise a load of 300N by the system.
[Ans : 3.6, 83.33N]
53. Name the type of a single pulley that can act as a force multiplier. Draw a labeled diagram of the above named pulley.
54. A pulley system with V.R. = 4 is used to lift the load of 175 kgf through a vertical height of 15 m. The effort required is 50 kgf in the downward direction. ($g = 10\text{N/kg}$) Calculate:
(i) Distance moved by the effort. (ii) Work done by the effort.
(iii) M.A. of the pulley system. (iv) Efficiency of the pulley system.
[Ans : 60 m, 30,000J, 3.5, 0.875 or 87.5%]
55. A block and tackle system has V.R. = 5
(i) Draw a neat labeled diagram of a system including the direction of its load and effort.
(ii) Rohan exerts a pull of 150 kgf. What is the maximum load he can raise with this pulley system if its efficiency = 75%.
[Ans : M.A. = 3.75, load = 562.5 kgf] [Hint : $\text{eff} = \text{MA}/\text{V.R.}$]
56. (i) Draw a neat labeled diagram of a block and tackle system of pulley with two pulley in each block. Including the direction of the load, effort and tension in the string.
(ii) Write down the relation between the load and the effort of the pulley system.

NUMERICAL:

Solve the remaining numerical from the textbook pg no. 68 and 69.