

PHYSICS

SIMPLE MACHINES

Total Marks: 25

Duration: 0 hours, 25 minutes

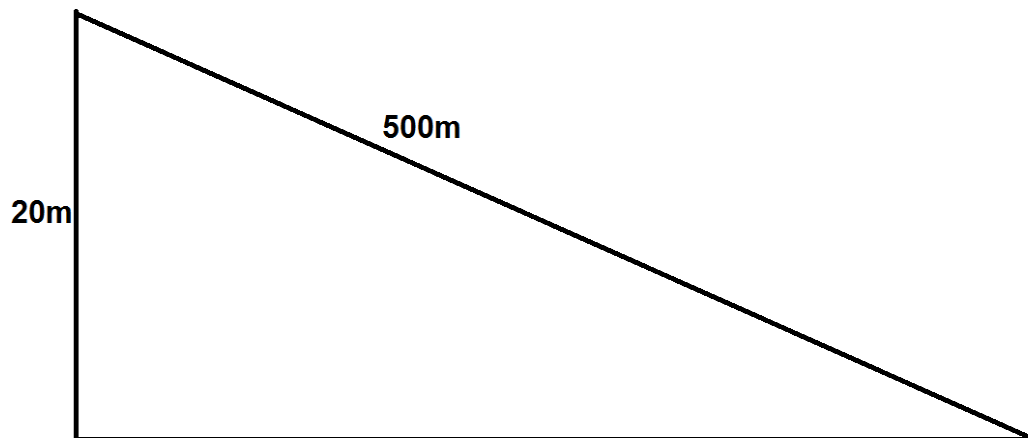
Instructions to test takers

1. Answer all the questions in this paper
2. All the answers for the questions in this paper will be found on **Study Star** (www.studystar.me)
3. Using the answers on the website, mark yourself truthfully and carefully.

Turn this page, time yourself and begin the test

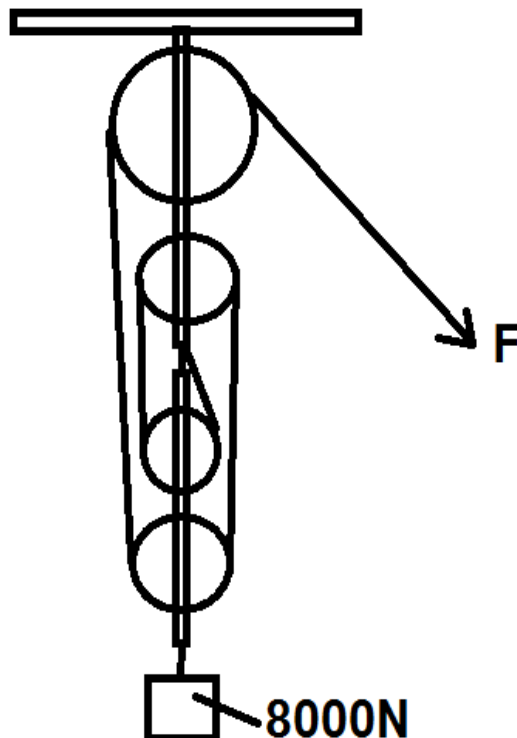
Section A [10 marks]

1. Which of the following best describes mechanical advantage?
 - a. The ratio of effort to load
 - b. The ratio of load to effort
 - c. The ratio of effort distance to load distance
2. Which of the following is not an example simple machine?
 - a. Wheel barrow
 - b. Bicycle
 - c. Lever
3. A wheel barrow is an example of _____
 - a. Pulley
 - b. Lever
 - c. Wheel and axle
4. A pulley system had 5 pulleys, if this was an ideal pulley system with an efficiency of 100%. What was the mechanical advantage?
 - a. 5
 - b. 4
 - c. 3
5. A wheel had a radius of 40cm and the axle had a radius of 10cm. Calculate the velocity ratio.
 - a. 0.4
 - b. 4
 - c. 2
6. A lever was found to have a mechanical advantage of 2.5 and a velocity ratio of 4. Calculate the efficiency of the system.
 - a. 50%
 - b. 62.5%
 - c. 75%
7. In a gear system, the driver wheel had 100 teeth and the driven wheel had 20 teeth. Calculate the velocity ratio.
 - a. 0.2
 - b. 5
 - c. 20%
8. Study the diagram below.



What is the velocity ratio?

- a. 25
 - b. 0.004
 - c. 10 000
9. The diagram below shows a frictionless pulley used to lift an 8000N block of concrete.



What is the minimum effort required to raise the block?

- a. 1600N

- b. 2000N
- c. 8000N

10. A simple machine of velocity ratio 5 is used to lift a load of 600N through a vertical distance of 20m. If the machine is 80% efficient, what is the effort applied?

- a. 4
- b. 150N
- c. 300N

Section B [5 marks]

11. The ratio of the effort distance to the load distance is called _____
12. The ratio of the work output to the work input is called _____
13. An ideal machine is one which is _____ efficient
14. A simple machine in which the effort used is magnified by the use of a pivot is called _____
15. The number of pulleys in a pulley always equals _____

Section C [10 marks]

16. A block and tackle system of 5 pulleys is used to raise a load of 500N through a height of 10m. If the work done against friction is 1000J, calculate the work done by the effort. [2]
17. Calculate the efficiency of the system in question 16 above. [2]
18. A box of mass 12kg is pulled up a straight smooth incline at 30° to the horizontal for a distance of 5m. Calculate the work done. [2]
19. A crane lifts a load of 2000kg through a vertical distance of 3m in 6 seconds. Calculate the work done. [2]
20. Calculate the power developed by the crane in question 19 above. [2]



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