1 Simple Machines Take-Home Exam v2

(1) **1**

| MULTIPLE CHOICE | marked out of 1.0 | penalty 0 | One answer only | Shuffle |

Which of the following is NOT considered one of the six simple machines?

   a. The lever
   b. The pulley
   c. The gear ✓
   d. The wedge

(2) **2**

| MULTIPLE CHOICE | marked out of 1.0 | penalty 0 | One answer only | Shuffle |

What is the mechanical advantage of a simple machine defined as?

   a. The total amount of work done by the machine
   b. The ratio of output force to input force ✓
   c. The ratio of input force to output force
   d. The total energy lost due to friction

(3) **3**

| MULTIPLE CHOICE | marked out of 1.0 | penalty 0 | One answer only | Shuffle |

In a first-class lever, where is the fulcrum located?

   a. Between the load and the effort ✓
   b. Between two loads
   c. At the end of the lever opposite to the effort
   d. It varies based on the type of lever

(4) **4**

| MULTIPLE CHOICE | marked out of 1.0 | penalty 0 | One answer only | Shuffle |

A wheelbarrow is an example of which class of lever?

   a. First-class lever
   b. Second-class lever ✓
   c. Third-class lever
   d. Compound lever

(5) **5**

A pulley system has three support ropes holding the load. What is the ideal mechanical advantage (IMA) of this pulley system?

   a. 1
   b. 2
   c. 3 ✓
   d. 6

(6) **6**

A lever has an effort arm of 2 meters and a load arm of 0.5 meters. What is the ideal mechanical advantage of the lever?

- 4 (0%)

(7) **7**

A wheel and axle system has a wheel with a radius of 0.6 meters and an axle with a radius of 0.2 meters. If the effort is applied to the wheel, calculate the ideal mechanical advantage.

- 3 ✓

(8) **8**

A worker uses an inclined plane that is 5 meters long and has a height of 1 meter. Calculate the ideal mechanical advantage.

- 5 ✓

(9) **10**

A screw advances 0.5 cm per revolution, and its head has a diameter of 2 cm. Calculate its ideal mechanical advantage.

- 12.57 ± 1 ✓

(10) **11**

Which factor affects the efficiency of a simple machine the most?

- a. The input force applied
- b. The presence of friction ✓
- c. The mechanical advantage
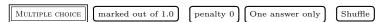- d. The shape of the machine

(11) **12**

The mechanical advantage of an inclined plane increases when:

- a. The slope increases
- b. The incline is shortened
- c. The incline is made longer while keeping the same height ✓
- d. The vertical rise is increased

(12) **13**

A pair of scissors is an example of which type of simple machine?

- a. First-class lever ✓
- b. Second-class lever
- c. Third-class lever
- d. Wheel and axle

(13) **14**

A pulley system is used to lift a 200 N load. If the system has an actual mechanical advantage (AMA) of 4, how much effort force is required to lift the load?

- 50 N (0%)

3

(14) **15**

A jackscrew has a handle with a length of 0.8 meters, and the screw advances 0.4 cm per turn. Calculate its ideal mechanical advantage (IMA).

- 125.66 ± 1 ✓

Total of marks: 14