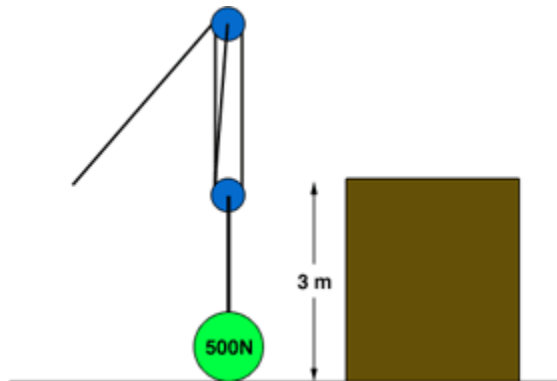


PRACTICE FOR HMST SCIENCE ENTRANCE EXAM

Note: The questions below are meant to give an idea of the type of topics on the Science Section of the HMST Entrance Exam.

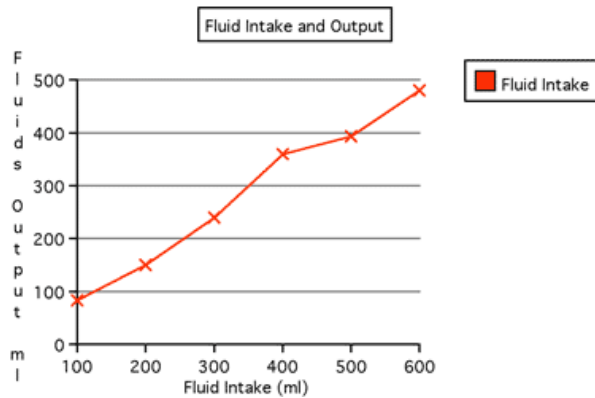
1. If you dissolve sodium acetate in water, the solution would be best classified as:
 - A) Heterogeneous
 - B) Aqueous
 - C) Colloid
 - D) Emulsion

Cliff needs to lift a 500 N ball onto a platform that is 3 m high. He decides that the best machine to help him is a set of pulleys called a block and tackle. He applies an input force of 100 N to the rope of the pulley, and finds that he has to pull out 18 m of rope to get the ball raised to the height of the platform.



2. What causes the pulley system to be less than 100% efficient?
 - A) Poor system design
 - B) Wind resistance
 - C) Low quality materials
 - D) Frictional forces
3. As you run off a sandy beach into the ocean, it becomes harder to move as your legs have to tread through deeper and deeper water. Why is it harder to walk in water than in air?
 - A) Water is lighter in mass
 - B) Water is less viscous
 - C) Water is more viscous and denser
 - D) Water is less dense

4. Organisms that exclusively feed on producers are called .
- A) Herbivore
 - B) Omnivores
 - C) Carnivores
 - D) Predators
5. This type of biome has trees that produce needles and cones such as pine and fir trees. Temperatures can be very cold. It is mostly found in northern Canada. It is also called by its Russian name, taiga.
- A) Tundra Biome
 - B) Desert Biome
 - C) Boreal Forest Biome
 - D) Deciduous Biome
6. An ice cap can be defined as
- A) an upland field of ice that feeds two or more glaciers
 - B) a large moving mass of compressed ice and snow
 - C) a glacier that forms on an extensive area of relatively flat land
 - D) none of the above
7. In rural areas, sewage is sometimes stored in a large underground container known as a
- A) Sewer
 - B) Septic tank
 - C) Effluent
 - D) Well
8. Which of the following traits is **not** a characteristic of all living organisms?
- A) They are made up of cells
 - B) They respond to the environment
 - C) They need energy to survive
 - D) They perform photosynthesis



9. The information in the above graph would show that
- A) as fluid intake increases, the kidneys produce more urine
 - B) as fluid intake decreases, the kidneys produce more urine
 - C) fluid intake has no effect on the amount of urine produced
 - D) fluid intake is the only factor that affects urine production

10. Refer to the information in question 9.

Which body system is the information in the graph alluding to?

- A) Digestive
 - B) Circulatory
 - C) Nervous
 - D) Excretory
11. Tissues are groups of similar cells. The epithelial tissue performs what function for the human body?
- A) Connects and supports different parts of the body
 - B) Moves the different parts of the body
 - C) Carries signals throughout the body
 - D) Protects the outside of the body
12. The chain of a bicycle is a
- A) Linkage
 - B) Connector
 - C) System
 - D) Component

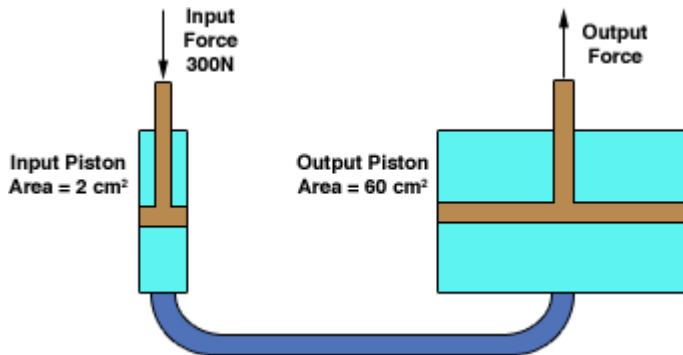
Sheila is investigating the effects of exercise on the human heart rate. She asks five of her classmates to participate in an experiment. The students are required to measure their heart rate for one minute before exercise and then immediately after running on the spot for two minutes. Here are the results:

Student	Heart Rate Before Exercise	Heart Rate After Exercise
Phillip	75	146
Shelly	83	166
Tannis	77	159
Steven	68	155
Brodie	64	171

13. In Sheila's experiment, what factor is the responding variable?

- A) Gender of the student
- B) Student heart rate
- C) Exercise
- D) Length of exercise time

The hydraulic lift below is used to move heavy loads:



14. If the input piston moves down a distance of 15 cm, how far up will the larger piston move?

- A) 30. cm
- B) 15 cm
- C) 0.50 m
- D) 0.50 cm

15. The majority of the ocean floors are relatively flat. These areas are referred to as
- A) Ocean ridges
 - B) Abyssal plains
 - C) Trenches
 - D) Flats
16. When a force of 350 N is exerted over an area of 5 m², what is the pressure exerted?
- A) 1750 kPa
 - B) 70 Pa
 - C) 70 kPa
 - D) 1750 PA
17. The change of state whereby a solid changes to a gas is better known as
- A) Condensation
 - B) Vaporization
 - C) Sublimation
 - D) Freezing
18. The structures responsible for circulation in a human body
- A) Are composed of several systems
 - B) Are considered an organ system
 - C) Are tissues
 - D) Are considered a system of tissues