2023 Science Bowl Practice Questions

1. What example below shows transformations of chemical energy to another kind of energy?

   Candle burning, person eating, plant growing, battery in flashlight

   a. Plant growing
   b. Candle burning
   c. Battery in flashlight
   d. Candle burning, person eating, battery in flashlight
   e. All are example of chemical energy being transformed

2. Which is not an example of electrical energy to mechanical energy?
   a. Electric fan
   b. Kitchen blender
   c. Hair dryer
   d. Electric baby swing

3. When riding a rollercoaster, where does the car have the greatest potential energy?
   a. At the beginning of the ride
   b. At the highest hill
   c. At the end of the ride
   d. At the lowest point of the ride

4. Photosynthesis in a growing plant transforms light energy from the sun into
   a. Electrical energy
   b. Thermal energy
   c. Mechanical energy
   d. Chemical energy

5. What is the kinetic energy of a 5 kg bowling ball traveling at a speed of 2 m/s?
   a. 10 joules
   b. 20 joules
   c. 25 joules
   d. 50 joules

6. If a bowling ball weighing 50 N is lifted to the top of a shelf 2 meters off of the floor, how much potential energy does the ball have?
   a. 50 Joules
   b. 40 Joules
   c. 25 Joules
   d. 100 Joules

7. If a bowling ball weighing 50 N that is sitting on a shelf 2.0 meters off the floor falls to the floor, how much kinetic energy will it have as it hits the floor?
   a. 100 Joules
   b. 25 Joules
   c. 50 Joules
   d. Not enough information is given to answer the problem

8. If a heavy box of books weighing 60 N is lifted to the top of a shelf 1.5 meters above the ground in 2 seconds, how much power did it take?
    a. 90 Watts
    b. 45 Watts
    c. 90 Joules
    d. 45 Joules

9. A bus traveling at a speed of 14 m/s has energy of 494,000 Joules. What is the mass of the bus?
    a. 2520 kg
    b. 5041 kg
    c. 35,286 kg
    d. Not enough information to answer the question

10. A pendulum with a period of 4 seconds has its string cut in half. What can be said about the period of the resulting pendulum?
    a. It will be longer
    b. It will be shorter
    c. It is impossible to determine
    d. It will remain the same

11. If the metal bob of a simple pendulum is replaced with a lighter wooden bob, then the period will _____.
    a. Increase
    b. Decrease
    c. Remain the same
    d. First increase, then decrease

12. The velocity of a pendulum bob is greatest at
    a. Either end
    b. Halfway between the highest point and the lowest point
    c. The lowest point
    d. Everywhere

13. Which object acting as a pendulum on the same length string will have the greatest kinetic energy at the bottom of the swing? Assume they are raised to the same height to begin motion.
    a. 1 kg ball
    b. 2 kg ball
    c. 3 kg ball
    d. 4 kg ball

14. How much work is done by pushing a wagon a distance of 10 meters with a force of 200 N in 20 seconds?
    a. No work is done because the wagon is not lifted
    b. 2000 Joules
    c. 20,000 Joules
    d. 1000 Joules

15. How much power was used in pushing a wagon a distance of 10 meters with a force of 200N in 20 seconds?
    a. 100 Watts
    b. 2000 Watts
    c. 25 Watts
    d. 2500 Watts

16. A child stands on a diving board 3 meters above the water. The child weighs 45 N. If he steps off the board, how much kinetic energy will he have as he hits the water?
    a. 0 Joules
    b. 57.5 Joules
    c. 135 Joules
    d. Impossible to determine without his velocity

17. What is the total energy a 50 N child standing on a diving platform 10 meters above the surface of a pool of water?
    a. 0 Joules
    b. 250 Joules
    c. 500 Joules
    d. Impossible to determine

18. A pendulum swings faster if the gravitational pull is stronger. Where would you expect to have the longest period for the same pendulum?
    a. One the moon
    b. In a cave
    c. At the equator on earth
    d. On Jupiter

19. What is periodic motion?
    a. A type of motion which happens infrequently
    b. A type of sustained motion that repeats over and over
    c. A type of motion caused by the rotation of the earth around the sun
    d. A type of motion that is inversely related to the force causing it

20. What is a force?
    a. A push
    b. A pull
    c. Energy
    d. Both a and b are correct

21. When the restoring force for a periodic motion is proportional to the displacement, the motion is considered
    a. Harmonic motion
    b. Simple harmonic motion
    c. Equilibrium
    d. Oscillating motion

22. Why is a child on a playground swing not considered simple harmonic motion?
    a. She can't get far enough off the ground
    b. Her mass is too big
    c. She is adding additional energy when she "pumps" the swing
    d. The distance from the ground is not constant

23. How is the period of a simple harmonic motion pendulum related to its frequency?
    a. The longer the period, the lower the frequency
    b. The longer the period, the higher the frequency
    c. There is no relationship between them
    d. The force creating the motion is directly proportional to both the frequency and the period
    e.

24. If a pendulum completes exactly 10 cycles in 10 seconds, what is the frequency of the pendulum?
    a. 100 Hz
    b. 10 Hz
    c. 1 Hz
    d. 0.1 Hz

25. Energy is the ability to
    a. Create
    b. Change or move matter
    c. Transform
    d. Reproduce

Answers on next page.

Science Bowl 2023 Practice Question Answers

1. D
2. C
3. B
4. D
5. A
6. D
7. A
8. B
9. B
10. B
11. C
12. C
13. D
14. B
15. A
16. C
17. C
18. A
19. B
20. D
21. B
22. C
23. A
24. C
25. B