

Science Exam

This exam is composed of three parts:

Part I: Physics

Part II: Chemistry

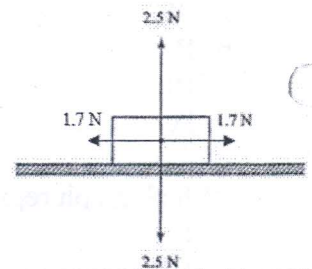
Part III: Life science

*Part I - Physics*

Answer the physics questions on the attached "Physics Answer Sheet" by crossing the letter that corresponds to the right answer.

1. The diagram below represents a block sliding across a table on a rectilinear pathway. The block is moving to the right. The velocity of the block during its motion:

- a. is nil.
- b. remains constant and is different from zero.
- c. increases.
- d. decreases.



2. If the sign of work is negative,

- a. the displacement is perpendicular to the force.
- b. the displacement is in the opposite direction to the force.
- c. the displacement is in the same direction as the force.
- d. no work is done.

3. Which of the following energy forms is associated with an object due to its position?

- a. potential energy
- b. positional energy
- c. total energy
- d. kinetic energy

4. Ball A has double the mass and speed of ball B. What is the ratio of the kinetic energy of ball A to ball B?

- a. 8
- b. 6
- c. 9
- d. 27

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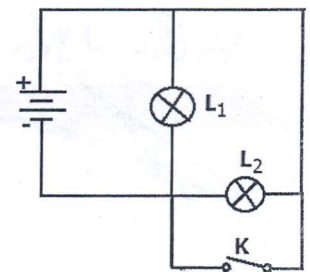
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10. Sound waves is slowest in
- gas.
  - liquid.
  - solid.
  - None of the above.
11. If the pendulum completes exactly 12 cycles in 2.0 min, what is the frequency of the pendulum?
- 0.1Hz
  - 0.17 Hz
  - 6 Hz
  - 10 Hz
12. When a sound waves travel from air into water, which property of the wave remains unchanged?
- speed
  - frequency
  - wavelength
  - amplitude
13. If a  $^{14}\text{C}$  has a half-life of 5730 years, then how long will it take for quantity of  $^{14}\text{C}$  in a sample to drop to  $1/8$  of initial quantity?
- $0.19 \times 10^4$  years
  - $1.44 \times 10^4$  years
  - $1.72 \times 10^4$  years
  - $2.58 \times 10^4$  years
14. How is light affected when it passes from less to more refractive medium?
- Its frequency increases.
  - Its frequency decreases.
  - Its speed increases.
  - Its speed decreases.
15. During the passage of light from air to water, if the incident angle is non-zero, it is:
- Strictly greater than the angle of refraction
  - Strictly less than the angle of refraction
  - Equal to the angle of refraction
  - None of the above

16. What happens when the switch K is closed in the adjacent circuit?
- Lamp  $L_1$  lights because current from the battery flows through it while lamp  $L_2$  goes out.
  - Lamps  $L_1$  and  $L_2$  lights normally because current from the battery flows through both lamps.
  - Lamp  $L_2$  lights because current from the battery flows through it while lamp  $L_1$  goes out.
  - Both lamps go out, because the battery terminals connect to each other.



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