

PHYSICS SAMPLE TEST

MULTIPLE CHOICE

Choose the one alternative that best completes the statement or answers the question.

1. A gram is:
 - A. 10^{-6} kg
 - B. 10^{-3} kg
 - C. 1 kg
 - D. 10^3 kg
 - E. 10^6 kg
2. The average speed of a moving object during a given interval of time is always:
 - A. the magnitude of its average velocity over the interval
 - B. the distance covered during the time interval divided by the time interval
 - C. one-half its speed at the end of the interval
 - D. its acceleration multiplied by the time interval
 - E. one-half its acceleration multiplied by the time interval.
3. A car travels 40 kilometres at an average speed of 80 km/h and then travels 40 kilometres at an average speed of 40 km/h. The average speed of the car for this 80-km trip is:
 - A. 40 km/h
 - B. 45 km/h
 - C. 48 km/h
 - D. 53 km/h
 - E. 80 km/h
4. Which of the following quantities is NOT a vector?
 - A. Mass
 - B. Displacement
 - C. Weight
 - D. Acceleration
 - E. Force
5. The standard 1-kg mass is attached to a compressed spring and the spring is released. If the mass initially has an acceleration of 5.6 m/s^2 , the force of the spring has a magnitude of:
 - A. 2.8 N
 - B. 5.6 N
 - C. 11.2 N
 - D. 0 N
 - E. cannot be calculated

6. A 2-kg object is moving at 3 m/s. A 4-N force is applied in the direction of motion and then removed after the object has travelled an additional 5 m. The work done by this force is:
- A. 12 J
 - B. 15 J
 - C. 18 J
 - D. 20 J
 - E. 38 J
7. A 64-kg woman stands on frictionless level ice with a 0.1-kg stone at her feet. She kicks the stone with her foot so that she acquires a velocity of 0.0017 m/s in the forward direction. The velocity acquired by the stone is:
- A. 1.1 m/s forwards
 - B. 1.1 m/s backwards
 - C. 0.0017 m/s forwards
 - D. 0.0017 m/s backwards
 - E. none of these
8. An object moving in a circle at constant speed:
- A. must have only one force acting on it
 - B. is not accelerating
 - C. is held to its path by centrifugal force
 - D. has an acceleration of constant magnitude
 - E. has an acceleration that is tangent to the circle
9. In simple harmonic motion, the magnitude of the acceleration is:
- A. constant
 - B. proportional to the displacement
 - C. inversely proportional to the displacement
 - D. greatest when the velocity is greatest
 - E. never greater than g
10. A force of 5000 N is applied outwardly to each end of a 5-m long rod with a radius of 34 mm and a Young's modulus of $125 \cdot 10^8 \text{ N/m}^2$. The elongation of the rod is:
- A. 0.002 mm
 - B. 0.004 mm
 - C. 0.14 mm
 - D. 0.55 mm
 - E. 1.42 mm

11. A rock, which weighs 1400 N in air, has an apparent weight of 900 N when submerged in fresh water (998 kg/m^3). The volume of the rock is:
- A. 0.14 m^3
 - B. 0.6 m^3
 - C. 0.9 m^3
 - D. $5.1 \cdot 10^{-2} \text{ m}^3$
 - E. $9.2 \cdot 10^{-2} \text{ m}^3$
12. Therby 300 g of an alloy as it cools through 50°C raises the temperature of 300 g of water from 30°C to 40°C . The specific heat of the alloy (in $\text{J}/(\text{g} \cdot ^\circ\text{C})$) is:
- A. 0.063
 - B. 0.42
 - C. 0.63
 - D. 0.84
 - E. 2.1
13. One mole of oxygen gas is at a pressure of $6.078 \cdot 10^5 \text{ Pa}$ and a temperature of 27°C . If the gas is heated at constant volume until the pressure triples, what is the final temperature?
- A. 9°C
 - B. 81 K
 - C. 81°C
 - D. 900°C
 - E. 900 K
14. Water waves in the sea are observed to have a wavelength of 300 m and a frequency of 0.07 Hz. The speed of these waves is:
- A. 0.00021 m/s
 - B. 2.1 m/s
 - C. 21 m/s
 - D. 210 m/s
 - E. none of these
15. The standard reference sound level is about:
- A. the threshold of human hearing at 1000 Hz
 - B. the threshold of pain for human hearing at 1000 Hz
 - C. the level of sound produced when the 1 kg standard mass is dropped 1 m onto a concrete floor
 - D. the level of normal conversation
 - E. the level of sound emitted by a standard 60 Hz tuning fork

16. A virtual image is one:
- A. towards which light rays converge but do not pass through
 - B. from which light rays diverge but do not pass through
 - C. from which light rays diverge as they pass through
 - D. towards which light rays converge and pass through
 - E. with a ray normal to a mirror passing through it
17. In a cinema, a picture 2.5 cm wide on the film is projected to an image 3 m wide on a screen that is 18 m away. The focal length of the lens is about:
- A. 7.5 cm
 - B. 10 cm
 - C. 12.5 cm
 - D. 15 cm
 - E. 20 cm
18. An electric field is most directly related to:
- A. the momentum of a test charge
 - B. the kinetic energy of a test charge
 - C. the potential energy of a test charge
 - D. the force acting on a test charge
 - E. the charge carried by a test charge
19. A $3\text{-}\Omega$ and a $1.5\text{-}\Omega$ resistor are wired in parallel and the combination is wired in series to a $4\text{-}\Omega$ resistor and a 10-V emf device. The potential difference across the $3\text{-}\Omega$ resistor is:
- A. 2 V
 - B. 6 V
 - C. 8 V
 - D. 10 V
 - E. 12 V
20. A car battery is rated at $80\text{ A}\cdot\text{h}$. An ampere-hour is a unit of:
- A. power
 - B. energy
 - C. current
 - D. charge
 - E. force