ALBERTA SCIENCE 10 · UNIT 2 · 25 QUESTIONS

# Physics — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

**1** **The SI unit used to measure energy is the**

- A newton
- B watt
- C joule
- D pascal

Understand It with Pulse | Flag a mistake

**2** **Which sequence best describes the energy conversions that take place in a battery-powered flashlight that is switched on?**

- A electrical → chemical → light
- B chemical → electrical → light and thermal
- C thermal → electrical → chemical
- D light → electrical → chemical

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3 **A car travels 240 km in 3.0 h. The average speed of the car is**



A 80 km/h

B 60 km/h

C 120 km/h

D 720 km/h

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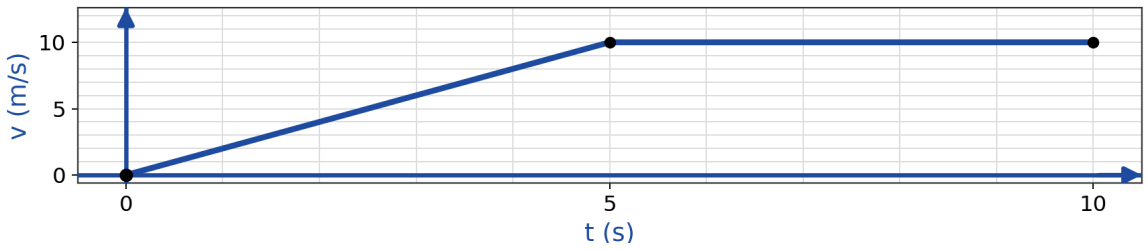
**4** **The kinetic energy of a moving object is calculated using the equation**

- **A** $E_k = mgh$
- **B** $E_k = mv$
- **C** $E_k = \frac{1}{}$
- **D** $E_k = \frac{1}{}$

Understand It with Pulse | Flag a mistake

**5** **The velocity-time graph shows the motion of a cart. The displacement of the cart during the first 10 s, in metres, is _____.**




ANSWER _____

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6 **The gravitational potential energy of an object depends on the object's**

- A mass and speed
- B mass and height above a reference level
- C speed and height above a reference level
- D speed only

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7 **Velocity differs from speed because velocity**

- A is measured in metres per second squared
- B can only be measured for objects that are slowing down
- C is always numerically larger than speed
- D includes the direction of motion

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**8** **The first law of thermodynamics states that**

- **A** energy is always lost as thermal energy during a conversion
- **B** a machine can produce more energy than it consumes
- **C** energy cannot be created or destroyed, only converted from one form to another
- **D** the total entropy of a system always decreases

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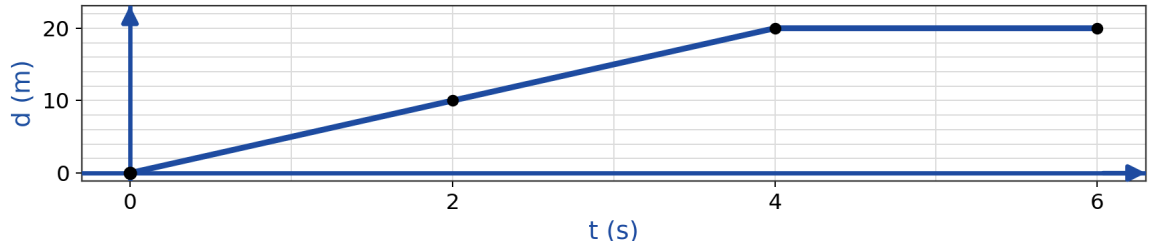
**9** **A cart starts from rest and reaches a speed of 24 m/s in 6.0 s. The acceleration of the cart, in metres per second squared, to the nearest tenth, is _____.**

ANSWER _____

Understand It with Pulse | Flag a mistake

**10** **The distance-time graph shows the motion of a toy car. The speed of the car during the first 4 s is**




- **A** 0 m/s
- **B** 2.5 m/s
- **C** 5.0 m/s
- **D** 10 m/s

Understand It with Pulse | Flag a mistake

**11** **The efficiency of a device is calculated by**

- **A** dividing the total energy input by the useful energy output
- **B** subtracting the useful energy output from the total energy input
- **C** dividing the total energy input by the time the device operates
- **D** dividing the useful energy output by the total energy input, then multiplying by 100%

Understand It with Pulse | Flag a mistake

12 **According to the second law of thermodynamics, no energy conversion can be 100% efficient because**

A some energy is always destroyed during a conversion

B friction can always be completely eliminated

C some of the input energy is always converted into unusable energy, usually thermal energy

D energy input always equals energy wasted

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13 **A 4.0 kg red rubber ball is moving at a speed of 5.0 m/s. The kinetic energy of the red rubber ball, in joules, is _____.**



ANSWER

Understand It with Pulse | Flag a mistake

14 **Which of the following objects has the greatest kinetic energy?**

A a 2.0 kg object moving at 3.0 m/s

B a 1.0 kg object moving at 5.0 m/s

C a 3.0 kg object moving at 2.0 m/s

D a 0.50 kg object moving at 6.0 m/s

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**15** **Which sequence best describes the energy conversions in a hydroelectric generating station?**



A gravitational potential → kinetic → electrical

B kinetic → gravitational potential → electrical

C chemical → kinetic → gravitational potential

D electrical → kinetic → gravitational potential

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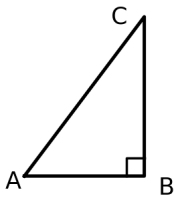
**16** **A student walks 30 m east from A to B, then 40 m north from B to C. The diagram shows the path. The magnitude of the displacement from A to C is**




- **A** 10 m
- **B** 70 m
- **C** 50 m
- **D** 120 m

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**17** **A 3.0 kg toolbox is raised to a shelf 10 m above the floor. Use g = 9.81 m/s². The gravitational potential energy gained by the toolbox, in joules, to the nearest tenth, is _____.**

ANSWER _____

Understand It with Pulse | Flag a mistake

18 **A lever has an effort arm of 1.2 m and a load arm of 0.30 m. The ideal mechanical advantage of the lever is**

- A 0.25
- B 2.5
- C 6.0
- D 4.0

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19 **A heat engine receives 600 J of energy input and produces 240 J of useful work. The percentage of the input energy that is wasted is**

- A 40%
- B 60%
- C 36%
- D 64%

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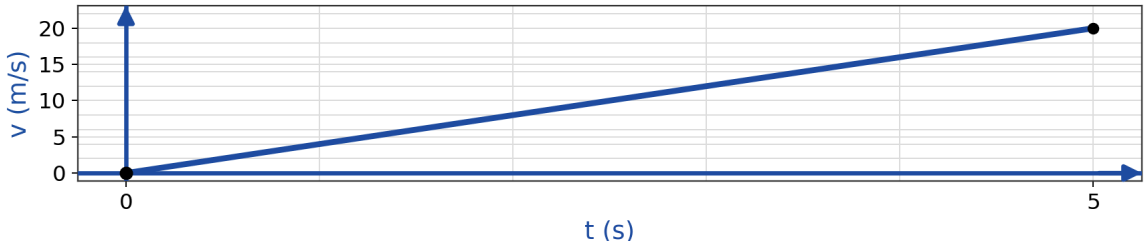
20 **An electric motor does 1200 J of work in 30 s. The power of the motor, in watts, is _____.**



ANSWER

Understand It with Pulse | Flag a mistake

**21** **The velocity-time graph shows a car accelerating uniformly. The acceleration of the car is**




A 2.0 m/s²

B 4.0 m/s²

C 5.0 m/s²

D 20 m/s²

Understand It with Pulse | Flag a mistake

22 **A pulley system has four strands of rope supporting the moving pulley and its 800 N load. Ignoring friction, the effort force needed to lift the load is**

- A 100 N
- B 400 N
- C 200 N
- D 3200 N

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23 **A machine uses 800 J of energy input and produces 560 J of useful energy output. The efficiency of the machine, as a percentage, is _____.**

ANSWER _____

Understand It with Pulse | Flag a mistake

**24** **A car accelerates uniformly from 8.0 m/s to 20 m/s in 6.0 s. The acceleration of the car is**



A 2.0 m/s²

B 4.0 m/s²

C 6.0 m/s²

D 12 m/s²

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25 **A crane lifts a 50 kg beam 4.0 m at a constant speed. Use g = 9.81 m/s². The work done by the crane on the beam, in joules, is _____.**



ANSWER _____

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# ANSWER KEY

1. C
2. B
3. A
4. D
5. 75
6. B
7. D
8. C
9. 4
10. C
11. D
12. C
13. 50
14. B
15. A
16. C
17. 294.3
18. D
19. B
20. 40
21. B
22. C
23. 70
24. A
25. 1962

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