

2022

Year 11 Integrated Science – Unit 2: Physical Science

Task 9: Physics Test **– MARKING KEY**

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| **Assessment Type:** |  | Name: |  |
| Test |  |
| **Duration & Conditions:**  Test conditions |  | Teacher: |  |
| 40 minutes |  |  |  |
| **Assessment weighting:**  5 % of year mark |  | Date: |  |

|  |  |
| --- | --- |
| **Section** | Marks |
| **Part one: multi-choice** |  |
| **Part two: Short Answer** |  |
| **Total Mark** |  |

I acknowledge that all the information contained in this task is my own work and not taken from other sources. If other sources have been used, they have been acknowledged in my references.

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(Student Signature)

Please see SEQTA for Teacher feedback and comments

# **PART ONE: MULTI-CHOICE**

1. The terms *speed* and *velocity* are used to describe objects which are moving. They:
   1. Mean the same thing and are measured with the same units.
   2. Are similar terms, measured with the same units, but are not exactly the same.
   3. Both involve measurements of distance, time and direction.
   4. Are used in different situations, with velocity being used only when values are very large.
2. A cyclist rides a hilly course between points P and U, as shown in the diagram to the right. The point that the rider has the most potential energy is.
   1. Diagram

      Description automatically generated
   2. R
   3. S
   4. T
   5. U
3. When we use the term “a force” we mean:
   1. Something that always causes something else to move.
   2. An occurrence that always causes major damage
   3. Simply a push or pull on something
   4. A push being applied to an object which moves as a result
4. Alinta is jumping straight up and down on a trampoline. Which of the following best describes the energy changes occurring when she falls onto the trampoline from maximum height?
   1. elastic potential energy → gravitational potential energy → kinetic energy
   2. gravitational potential energy → kinetic energy → elastic potential energy
   3. kinetic energy → gravitational potential energy → elastic potential energy
   4. elastic potential energy → thermal energy → kinetic energy
5. Which of the following is best explained by Newton’s **first** law?
   1. unbelted passengers will be thrown forward when a car stops suddenly
   2. a gun recoils when a shot is fired
   3. the acceleration of an object when a force is applied depends on the mass of the object
   4. the weight of an object varies from planet to planet
6. Which of the following is best explained by Newton’s **second** law?
   1. unbelted passengers will be thrown forward when a car stops suddenly
   2. a gun recoils when a shot is fired
   3. the acceleration of an object when a force is applied depends on the mass of the object
   4. the weight of an object varies from planet to planet
7. Which of the following is best explained by Newton’s **third** law?
   1. unbelted passengers will be thrown forward when a car stops suddenly
   2. a gun recoils when a shot is fired
   3. the acceleration of an object when a force is applied depends on the mass of the object
   4. the weight of an object varies from planet to planet
8. An object is acted upon by a thrust force of 50 N and a total frictional force of 40 N. The net force will be:
   1. 90 N backwards.
   2. 90 N forwards.
   3. 10 N forwards.
   4. 10 N backwards.
9. Which of the following forces produces a change in motion?
   1. unbalanced force
   2. balanced force
   3. gravitational force
   4. frictional force
10. Using the below distance-time graph for a moving body, the speed of the body at point C will be:
    1. 10.1m/s
    2. 3.3m/s
    3. 4.2m/s
    4. 2.6m/s

Chart, line chart

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# **PART TWO: SHORT ANSWER**

1. Describe Newton’s Third Law in your own words, using an appropriate example to help your description. (3 marks)

2 marks – state the Law - For every action force there is an equal and opposite reaction force.

1 mark – example. Gun recoiling as a bullet is fired

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1. Describe what is meant by Inertia. (2 marks)

1 mark – continue current motion

1 mark – resist force causing change in speed or direction

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1. Which object would have the largest inertia? A car or a Bicycle? Explain your answer (2 marks)

1 mark – car

1 mark – because the mass of the car is greater

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1. Place the following quantities into the correct column of the table. (6 marks)

**mass speed velocity displacement distance acceleration\**

|  |  |
| --- | --- |
| **Scalar quantity** | **Vector quantity** |
| Mass | Velocity |
| Speed | Displacement |
| Distance | Acceleration |
|  |  |

1. Shape

   Description automatically generatedA rollercoaster is stationary at the top of the track. Using the diagram above and assuming that there is no friction or wasted energy, circle the correct answer to the following questions. (3 marks)
2. Where does the cart have the highest gravitational potential energy?

A B C D All points are the same

1. Where does the cart have the highest kinetic energy?

A B C D All points are the same

1. Where does the cart have the highest total energy?

A B C D All points are the same

1. An aircraft is being simultaneously affected by 4 forces:

|  |  |
| --- | --- |
| * “Lift”, acting vertically upwards * “Weight”, acting vertically downwards | * “Thrust”, acting horizontally forwards * “Drag”, acting horizontally backwards |

Sketch the vector diagram of these forces to show any “resultant” net force acting when: (8 marks)

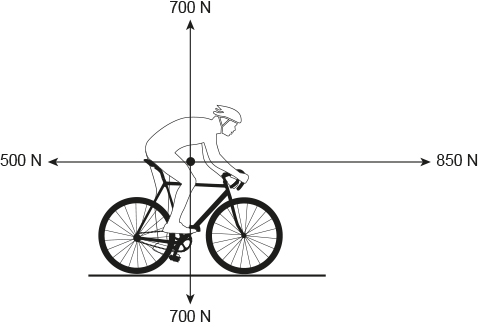
|  |  |
| --- | --- |
| 1. transparent background airplane clipart - Clip Art Librarythe plane is in level flight at constant velocity. | 1. transparent background airplane clipart - Clip Art Librarythe aircraft is speeding up AND gaining height |

1. A 60kg cyclist exerts a net force of 100N pedalling his 15kg bike for 10.0 seconds. Ignoring any friction;
2. what acceleration will be produced? (3 marks)

1 mark for correct formula

1 mark for correct answer

1 mark for answer statement ؞ the acceleration of the cyclist is 1.3ms-2

1. In the diagram below, will the cyclist be travelling in a state of constant motion? Explain your answer

(3 marks)

1 mark – no

1 mark – it is accelerating to the right

1 mark – the force is unbalanced there is a great force pushing the bike to the right.

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**END OF ASSESSMENT**