IBMYP Physics
Sample Paper 2

Group 5: Physics
On-Screen Examination

Total Marks: 80

Instructions

- The on-screen examination has not yet started.
- Your time will begin once you have clicked the Start button below. Do not click Start until instructed to do so.
- Before the examination begins you are given 5 minutes to become familiar with its structure. Please navigate around the examination, taking note of the length of each task and question. You have 2 hours to complete the examination.
- There are 10 separate questions in this examination. Each question may have sub-parts. Answer all the questions in the response boxes provided. The maximum mark for this examination is 100 marks.
- As you progress through the questions, your answers are automatically saved.
- When 2 hours has ended. you will no longer be able to answer any questions.

Question 1: 9 marks

1. **To calculate force, we use the equation below:**

$$F = ma$$

   a. **State the units in which the quantities below are measured in (2 marks)**
      - **Force:** _____
      - **Mass:** _____
      - **Acceleration:** _____

Answer:
   - **Force:** *Newtons (N)*
   - **Mass:** *Kilograms (kg)*
   - **Acceleration:** *Meters/second² (m/s²)*

   b. **Consider an object of mass 1.5 kg that is experiencing a constant force, F, resulting in an acceleration of 6 m/s². The force acts in the direction of motion. Explain why an object with twice the mass but the same acceleration would have twice the momentum. (2 mark)**

Answer:
The equation for momentum is p = mv, where p represents momentum, m represents mass, and v represents velocity. If an object has twice the mass but the same acceleration, its velocity would also be twice that of the original object (as acceleration remains the same). Since momentum is directly proportional to velocity, the object with twice the mass would have twice the momentum.

c. **Two objects, A and B, with the same mass are initially at rest. Object A experiences a force that is twice as large as the force acting on object B. Compare the accelerations of objects A and B. (3 marks)**

Answer:
If object A experiences a force that is twice as large as the force acting on object B, but both objects have the same mass, the acceleration of object A would be half that of object B. This is because acceleration is inversely proportional to mass, given the same force.

d. **If an object experiences a force of 12 N and has an acceleration of 4 m/s², calculate its mass using the equation F = ma. (2 marks)**

Answer:
Given that the force (F) is 12 N and the acceleration (a) is 4 m/s², we can rearrange the equation F = ma to solve for mass (m). Substituting the given values, we have:
   12 N = m × 4 m/s²
   Dividing both sides by 4 m/s², we get:
   m = 12 N / 4 m/s²
   m = 3 kg

Therefore, the mass of the object is 3 kg.

Question 2: 7 marks

2.   Consider a wastewater treatment plant that helps purify water by removing pollutants and contaminants. The plant utilizes an electrical mechanism to aid in the purification process.

TYCHR

Friend, Philosopher, Guide

WWW.TYCHR.COM

+91 9540653900