

KRYPTON SHARIFF EXAMINATION BOARD

Senior One – Physics – End of Term Examination

Time Allowed: 2 Hours

SECTION A: (Answer All Items)

Item 1

At Crestland Sports Hall, students were pushing and pulling gym equipment to rearrange it for an event. Some students pulled a bench while others pushed it in the opposite direction. One group noticed the bench moved slower on rough concrete than on the smooth floor tiles. Their teacher reminded them about how forces work in real-life situations.

As a Physics student, your task is to:

- (i) Define a force and state two effects a force can have on a body.
- (ii) Differentiate between contact and non-contact forces with one example each.
- (iii) Describe how to determine the frictional force acting on a wooden block using basic school equipment.
- (iv) Two students pull a desk: one pulls with 12 N east, another with 7 N west. Calculate the resultant force and state its direction.
- (v) Explain how surface roughness affects the frictional force between two surfaces.
- (vi) State one advantage and one disadvantage of friction in daily life.

Item 2

During a science club session, learners observed how water formed curved edges when in a narrow glass tube, and how small insects walked on water without sinking. One learner poured water on a glass slide and noticed the droplets held together. The teacher told them these were results of special forces acting between particles and surfaces.

As a Physics student, your task is to:

- (i) Define cohesion and adhesion, giving one example of each.
- (ii) Describe how capillary action is demonstrated when water rises in a narrow straw.
- (iii) Explain surface tension and give one way it is useful in nature.
- (iv) State two ways surface tension can be reduced or broken.
- (v) Identify the force responsible for water falling from a tap to the ground.

(vi) A box is pulled northward with a force of 10 N and another student pulls it eastward with 10 N. Calculate the resultant force and state the angle between the forces.

Item 3

At Crestland Innovation Week, students were asked to design a water bottle using recycled plastic. Before production, they had to measure the volume of the bottle, mass of water it could hold, and its density. Some also explored why a small rubber cap floated while a metal coin sank in water. In their science talk, one student mentioned the plasma state of matter used in smart TVs.

As a Physics student, your task is to:

(i) Define measurement and name four physical quantities that can be measured directly.

(ii) Describe how to measure:

Length of a pen

Volume of an irregular stone

Mass of a sugar sample

(iii) State the SI unit for each of the above quantities.

(iv) A metal block has a mass of 150 g and volume of 60 cm³. Calculate its density in g/cm³.

(v) Explain why a coin sinks in water but a rubber cap floats.

(vi) Name the four states of matter and briefly describe where plasma can be found in modern technology.

SECTION B: PART I (Attempt Only One Item)

Item 4

While preparing the school lab, two students opened bottles of perfume and vinegar at opposite corners of the room. After some time, the whole lab was filled with both smells. A science teacher asked them to link this to diffusion and motion of particles.

As a Physics student, your task is to:

(i) Explain how diffusion occurs using the particle theory of matter.

(ii) State why gases diffuse faster than liquids.

(iii) Describe the Brownian motion and give one piece of evidence that supports it.

(iv) A glass of ink was placed in water and left untouched. After some time, the whole water

turned blue. What physics concept does this demonstrate and why?

(v) State one factor that affects the rate of diffusion.

Item 5

At Crestland farm, a worker used a rubber pipe to suck water from a tank placed 1.5 metres above the ground. Meanwhile, a leaf was floating on water inside a container. Another worker noticed that the water curved upwards at the edges of a glass tube dipped in it.

As a Physics student, your task is to:

(i) Identify the type of force that causes water to rise in the tube.

(ii) Differentiate between cohesion and adhesion.

(iii) State two effects of force on a body.

(iv) Give two examples of contact forces and two of non-contact forces.

(v) A cart is pushed with two forces: 6 N east and 8 N north. Calculate the resultant force acting on it and state its direction.

SECTION B: PART II (Attempt Only One Item)

Item 6

After visiting a hill station, Namugga noticed the air was very cool. Her phone showed a temperature of 13°C. She used a thermometer her teacher had given her. At school, they had learned about thermometers, temperature scales, and heat.

As a Physics student, write a brief report to your science club explaining:

What temperature is and how it is measured.

The relationship between the Celsius and Kelvin scales.

Two types of thermometers and their specific uses.

The importance of thermometric liquids and why mercury or alcohol is used.

How temperature varies with altitude and how this affects daily life.

Item 7

During a blackout, the school chef boiled water over a charcoal stove. Later, students observed that the metal kettle was hot even at the top. They asked their teacher why heat seemed to move through it and whether air also gets hot in the same way.

As a Physics student, write an explanatory article for your school science magazine describing:

The difference between heat and temperature.

By Mr krypton sharif 0709911018