

BSS CLUSTER MODEL JOE PHYSICS

SECTION A MARKING KEY

1	C	6	B	11	C	16	D
2	B	7	B	12	A	17	B
3	C	8	B	13	A	18	A
4	A	9	C	14	A	19	B
5	A	10	C	15	C	20	D

SECTION B

21 (a) leaf electroscope.

(b) brass cap.

(c) Bring a charge to be identified close to the brass cap. Observe the behaviour of the leaf. If it rises the unknown charge has the same charge as the electroscope, if otherwise the charges are ^{opposite}.

22 (a) Lunar eclipse.

(b) The image becomes blurred and more bright (brighter)

(c) It means both far and near objects can form clear images on the screen.

23 (a) Protons and neutrons.

(b) alpha, beta and gamma.

(c) Source of energy.

cure cancer (treat cancerous cells)
detecting leakages in pipes

24 (a) The increase in volume of a substance on heating.

(b) Provide smooth slide of the steel bridges during expansion and contraction.

(c) There are strong forces of attraction between particles



- 25 (a) • Breaking of soft drinks in deep freezers.
• Bursting of water pipes in freezing winters
• Weathering of rocks in freezing winters

(b). When water is heated at 0°C it contracts until the temperature reaches 4°C due to anomalous behaviour of water. Hence the volume decreases. After 4°C water behaves normally on heating. Hence the volume increases uniformly.

26 (a) It is the amount of heat required to raise the temperature of a substance by 1°C or 1K .

(b) $H = 18000\text{J}$, $m = 600\text{g}$ $T_i = 21^{\circ}\text{C}$
 $c = 4200\text{J/kg}^{\circ}\text{C}$

$$m = \frac{600\text{g}}{1000\text{g}} \times 1\text{kg} = 0.6\text{kg}$$

$$\Delta T = \frac{H}{m \times c}$$
$$= \frac{18000\text{J} \times \text{kg}^{\circ}\text{C}}{0.6\text{kg} \times 4200\text{J}}$$

$$T_f = T_i + \Delta T$$
$$= 21^{\circ}\text{C} + 7.14^{\circ}\text{C}$$
$$= 28.14^{\circ}\text{C}.$$

27 (a) Load = Weight of the block being raised

$$\begin{aligned} &= m \times g \\ &= 12 \text{ kg} \times 10 \text{ N/kg} \\ &= 120 \text{ N} \end{aligned}$$

(b) Ratio velocity = # of wheels ^{or rope sections} used to raised the load.
 $= 2.$

(c) $VR = 2$, $E = 60 \text{ N}$, $M L = 120 \text{ N}$

$$MA = \frac{L}{E} = \frac{120 \text{ N}}{60 \text{ N}} = 2.$$

$$E = \frac{MA}{VR} \times 100\%$$

$$= \frac{2}{2} \times 100\%$$

$$= 100\%.$$

28 (a) The voltage across the battery in a circuit when the circuit is open.

(b) Used in electric pressing iron

Used in electric light bulb.

Used in cooking / heat element in cooker.

29 (a) $R = \text{Zero (0)}$. {constant velocity}.

(b) The frictional force increases.



30 (a) X

(b) Y

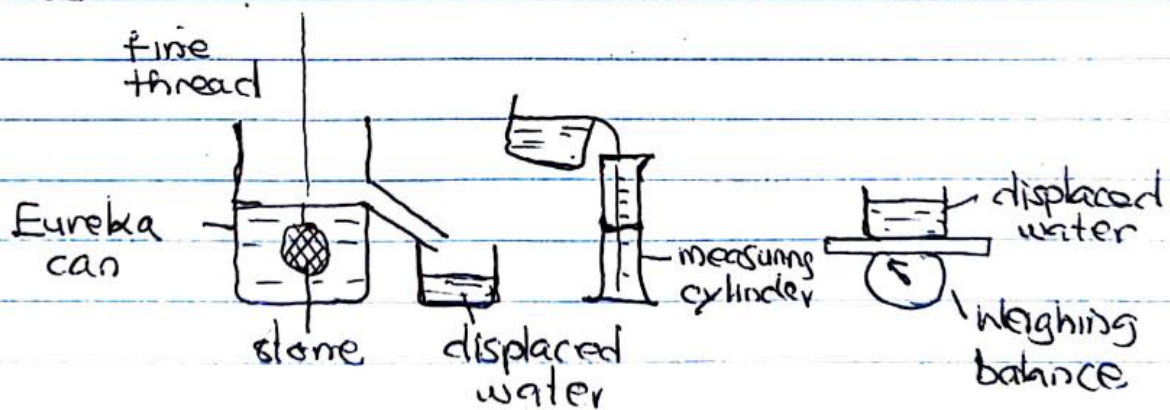
(c) From W to X Kinetic energy decreases while Potential energy increases.

SECTION C

31(a). It is made up of two different metal wires.

- The wires are joined at one end.
- The other two ends of the wire are connected to galvanometer.
- Heat is supplied at the junction.
- This develops a small voltage in the loop (circuit) which is detected by the galvanometer.

31(b)

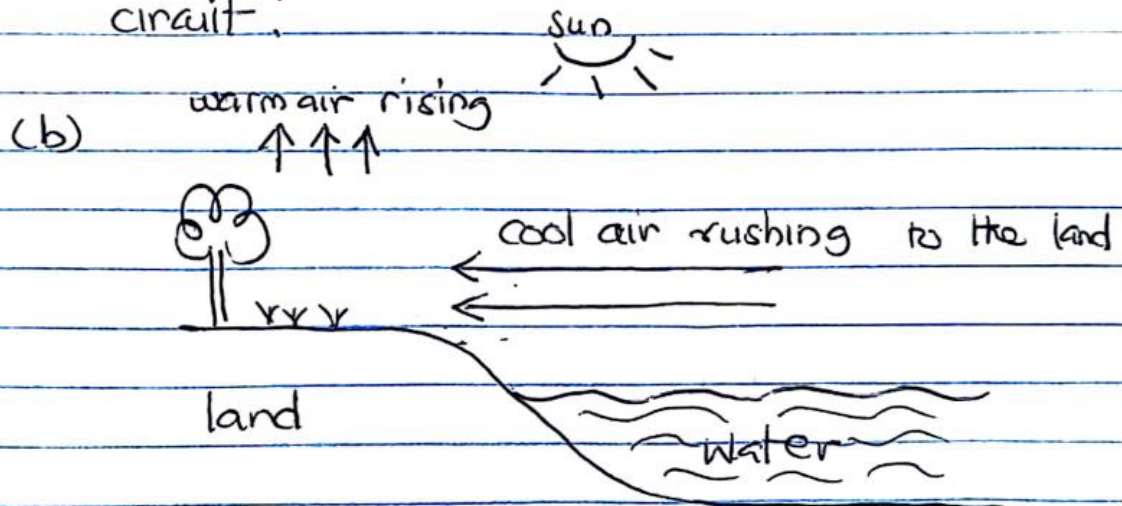


- Add water into eureka can until it overflows.
- Then place a beaker under the spout of the can.
- Tie a stone to a fine thread and lower it slowly into the can. (water is displaced through the spout)
- Determine the mass of the water using the weighing machine.
- Pour the displaced water in a measuring cylinder to determine its volume.

- Find density of the stone as follows:

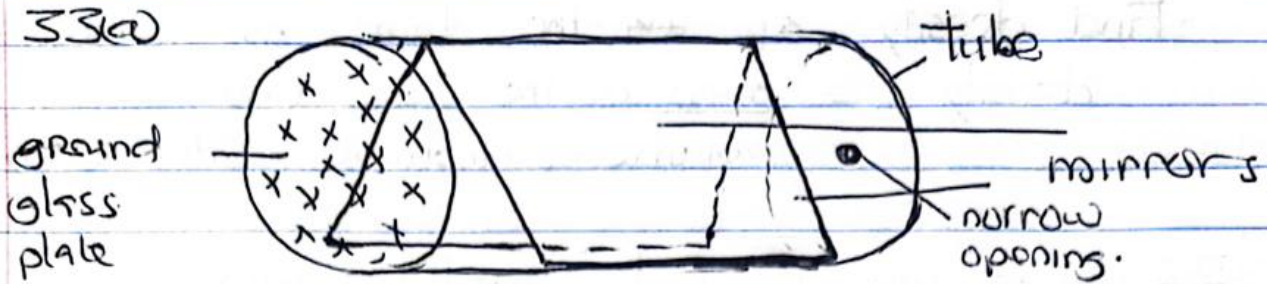
$$\text{density} = \frac{\text{mass of the stone (g)}}{\text{volume of displaced water (cm}^3\text{)}}$$

32 (a) A fuse is a low melting wire. It has its rating slightly above the rating of the appliances. In case of high voltage, large current causes the fuse wire to heat up. Eventually it melts and breaks the circuit.



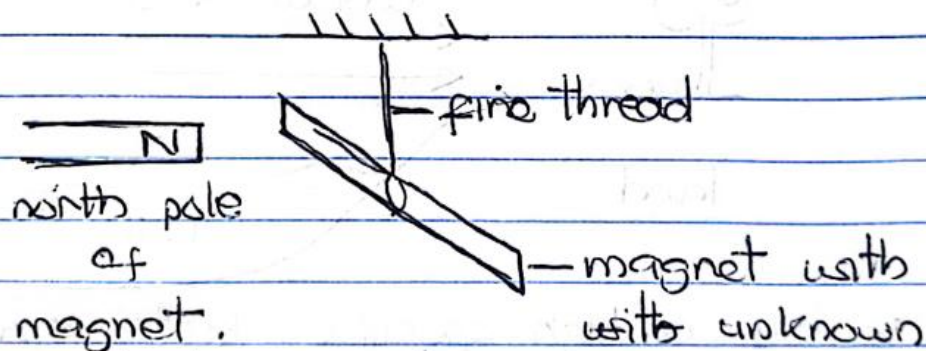
- Water has a high specific heat capacity than land. Therefore land heats up faster than water.
- During the day, land heats up and warm air over the land becomes light (less dense) and rises, leaving a partial vacuum behind.
- This draws cool air from the sea which is cool because water heats up slowly.
- The cool air from the sea (water) is thus termed cool land breeze.

33 33(a)



A device used to produce a series of images. Two plain mirrors are placed at 60° each other in a tube. At one end ground glass plates are placed and at the other end there is an opening. The opening is used to view a series of 6 images in the tube when it is shaken.

33 (b)



- Suspend a test magnet.
- Bring a north pole of a magnet close to the test magnet. (observe)
- If there is attraction, exchange polarity until so that repulsion takes place.
- Deduce the type of poles of a magnet using repulsion only.