Final Paper

SECTION A (Total 80 marks)

Answer **all questions** in this section.

1. This is a list of 10 organs found in the human body.

Diaphragm	**Brain**	**Intestines**	**Capillaries**	**Gullet**
Lungs	**Womb**	**Arteries**	**Neuron**	**Ovaries**

Select **two** organs that are found in each of these five **systems** in the human body. Each organ should be used only once. [5]

Reproductive system _____

Digestive system _____

Nervous system _____

Circulatory system _____

Respiratory system _____

2. State whether each of these statements about the human digestive system is true or false by placing a **'T'** for a true statement or an **'F'** for a false statement in the boxes provided. [4]

(a) Both the liver and the pancreas are important in the digestion of fats. ☐

(b) Food is moved through the gut (alimentary canal) by the action of gravity ☐

(c) Enzymes in the stomach work best under conditions of high pH. ☐

(d) The human gut is about 10-metres long ☐

3. Write down **four** changes a girl experiences during puberty. [4]

(a) _____

(b) _____

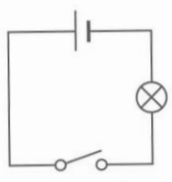
(c) _____

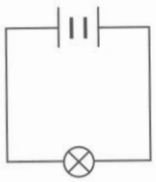
(d) _____

4. Heredity is the passing of genetic information from one generation to the next. Compare the appearance of yourself to one of your family members. Give three ways in which you are similar and three ways in which you are different. [6]

Similar (genetic)	Different (non-genetic)
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____

5. In **five** of the circuits given below, the bulb will **not** light up. Identify the five circuits and explain why they will not light up. [5]


Circuit A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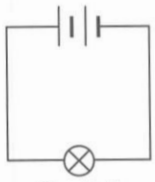
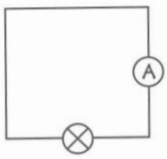
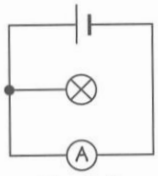
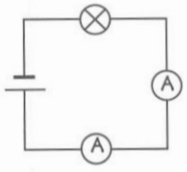

Circuit C



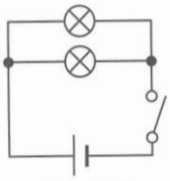
Circuit D

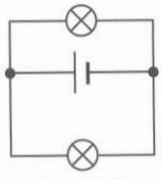


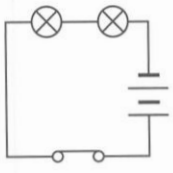
Circuit E



Circuit F


Circuit G


Circuit H


Circuit I

(i) _____

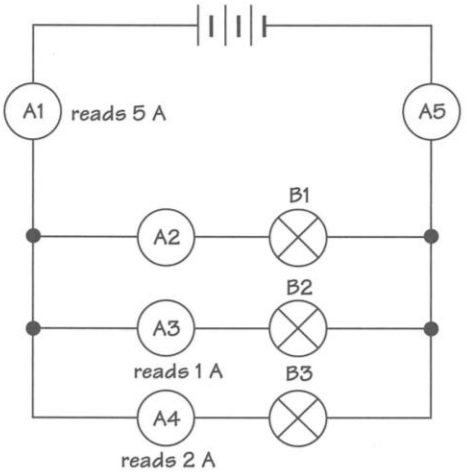
(ii) _____

(iii) _____

(iv) _____

(v) _____

6. The diagram shows various ammeters positioned at different points in the circuit. The three bulbs B1, B2 and B3, which are in parallel, are **not identical**. You may assume that all the ammeters are connected correctly.



(a) What is the reading on the

(i) ammeter A2? [1] _____

(ii) ammeter A5? [1] _____

(b) The reading on ammeter A4 is twice that of ammeter A3. What does that tell you about the resistances of the two bulbs B2 and B3? [1]

_____

(c) What is the resistance of B1 compared to B2 and B3? [1]

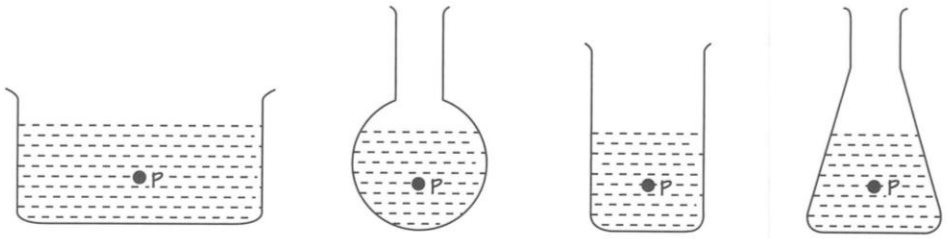
_____

7. Complete this paragraph about digestion by filling in the missing words chosen from the list. Some of the words will not be used. [5]

Carbohydrate	**Fat**	**Protein**	**Large intestine**
Small intestine	**Enzymes**	**Cell**	**Blood**

A _____ molecule is made up of a long chain of smaller molecules called amino acids. The bonds joining these amino acids together can be broken by _____. The individual amino acids can then pass through the walls of the _____ into the _____ where they are transported to every living _____ in the body.

8. Four different laboratory vessels containing water are shown.



Water trough | Round-bottomed flask | Beaker | Conical flask

Can you explain why the pressure at point P at the bottom of each container is the same? [3]

_____

_____

_____

9. Explain the following in terms of expansion and contraction.

(a) Why do you place the neck of a bottle under a hot water tap when a stopper is stuck in the bottle? [2]

_____

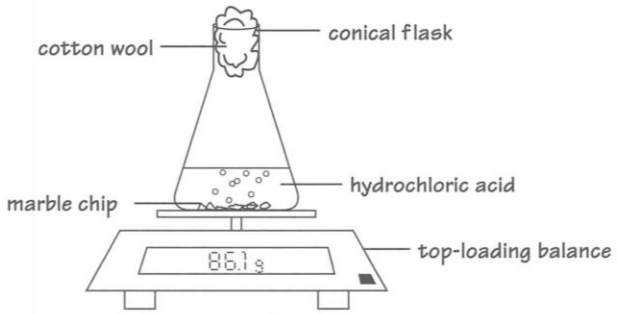
_____

(b) A dented table tennis ball can be fixed by placing it in a bowl of hot water. [2]

_____

_____

10. Lucas carried out an experiment to investigate the speed at which marble (calcium carbonate) dissolves in hydrochloric acid. A conical flask containing the marble chip and excess hydrochloric acid was placed on a top loading balance, as shown in the diagram. Mass was lost as carbon dioxide gas was given off. He recorded the change of mass of the flask and contents in the table.



Time (min)	0	1	2	3	4	5	6	7	8
Mass of contents of flask (g)	87.6	86.1	85.1	84.5	84.2	84.0	83.9	83.9	83.9
Loss in mass (g)	0	1.5	1.0						

(a) Complete the table by working out the loss in mass of the flask. [5]

(b) Plot a graph of loss in mass (y-axis) against time (x-axis). [4]

(c) When was the reaction fastest? [1]

_____

(d) When did the chemical reaction stop? [1]

_____

11. Complete the following chemical equations in words by filling in the spaces. [8]

(a) sodium + _____ → sodium oxide

(b) _____ + oxygen → carbon monoxide

(c) _____ + _____ → sodium chloride

(d) aluminium + chlorine → _____

(e) iron + sulphur → _____

(f) _____ + _____ → potassium sulphide

12. Match the energy sources to their correct description by drawing a line between the two. [5]

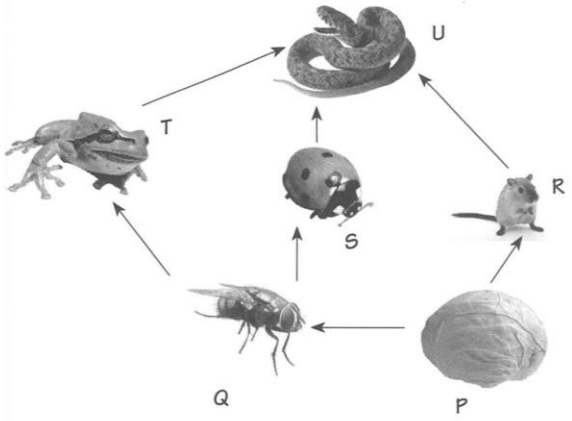
Bio-fuel	•	•	Movement of water due to the attraction of the moon
Wind power	•	•	Heat energy from beneath the earth
Solar energy	•	•	Plant or animal material used as a fuel
Tidal energy	•	•	Motion of the earth's atmosphere
Geothermal	•	•	Energy from the sun

13. In the space provided, draw a food web to show the following connections:

- green plants being eaten by insects, sheep and rabbits
- insects being eaten by frogs
- frogs, sheep and rabbits being eaten by foxes

[4]

14. In the food web below, each group of living things has been given a 'code letter'.



Use 'code letters' for each living group to answer the following questions.

(a) Which group contains

(i) the smallest number of individuals? [1] _____

(ii) the greatest total weight of living things? [1] _____

(b) Which group(s) is/are

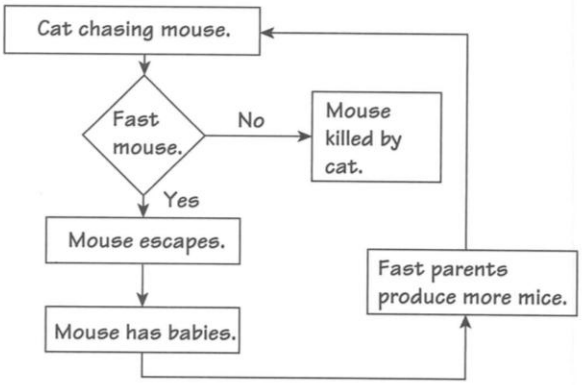
(i) secondary consumers? [1] _____

(ii) tertiary consumer? [1] _____

(c) Which groups are herbivores? [1] _____

(d) Where does the energy come from for P? [1] _____

15. With the help of the flow chart below, explain why successive populations of mice are more likely to escape from cats. [2]



_____

_____

_____

_____

16. Match these activities of human beings with their effects on the environment. Do this by drawing a line between the activity and its effect. [4]

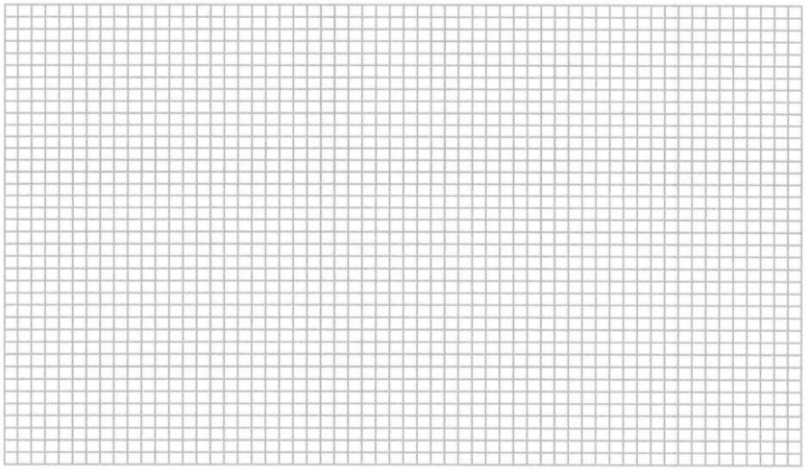
Releasing too much sulphur dioxide into the air.	•	•	Shortage of natural drugs.
Burying poisonous chemicals in the ground.	•	•	Certain wildlife becoming extinct.
Over-hunting of animals.	•	•	Minerals being washed away from the soil.
Cutting down large areas of forest.	•	•	Water supplies becoming polluted.

SECTION B (20 marks)
EITHER

1. Moishe investigated the speed of a chemical reaction of zinc metal with sulphuric acid to produce a salt. He did this by counting the number of bubbles of gas given off every half-minute. His results are shown in the table.

Time (min)	Total number of bubbles
0	0
0.5	69
1.0	105
1.5	123
2.0	136
2.5	146
3.0	154
3.5	160
4.0	164
4.5	166
5.0	167
5.5	168
6.0	168

(a) Plot a graph of the total number of bubbles (y-axis) against time (x-axis). [4]



(b) **(i)** When was the reaction fastest? [1]

_____

(ii) When did the reaction finish? [1]

_____

(c) Which gas was given off during the experiment? [1]

_____

(d) Write a word equation for this chemical reaction. [2]

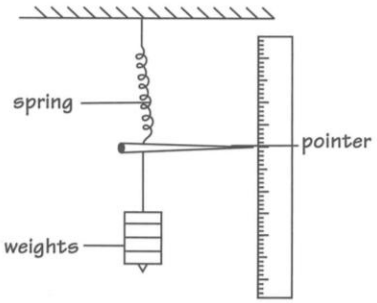
_____

(e) What gas would be given off if zinc carbonate was used instead of zinc metal? [1]

_____

OR

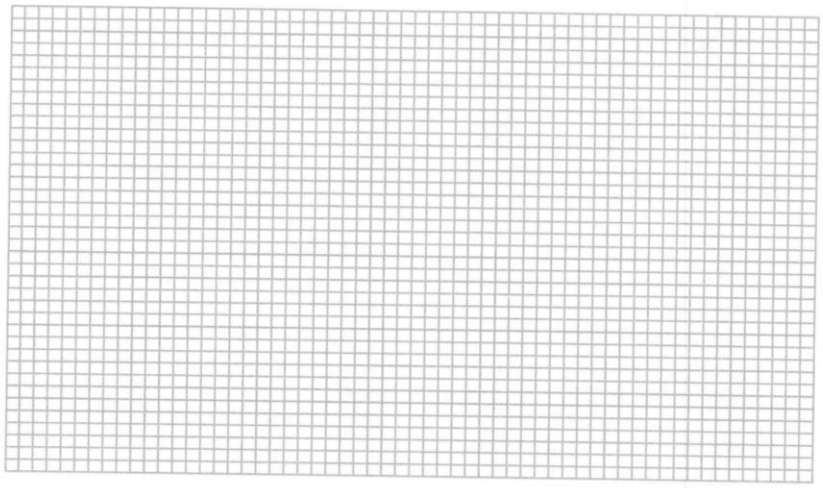
1. Eli carried out an experiment to investigate the stretching of a spring with different amount of forces. His results are shown in the table below.



Force	Length of spring	Extension of spring (cm)
0	12.0	0
10	12.7	0.7
20	13.4	
30	14.1	
40	14.8	
50	15.5	
60	16.2	

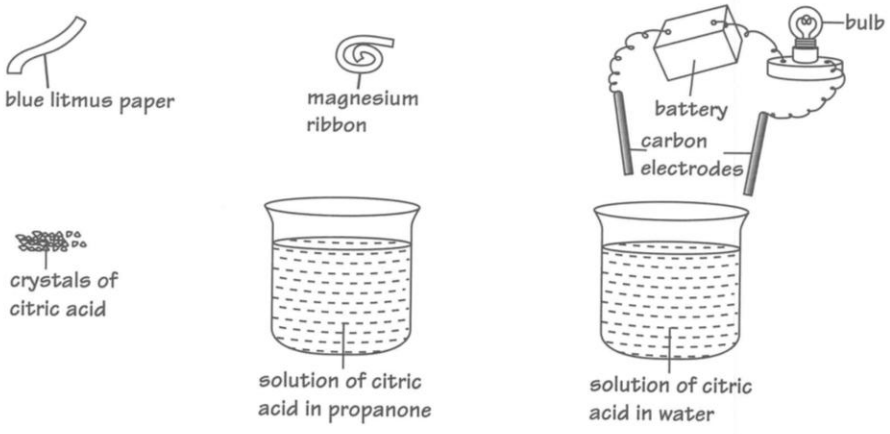
(a) Complete the table by calculating the extension of the spring. [3]

(b) Plot a graph of force (y-axis) against extension (x-axis). [4]



(c) Explain the shape of the graph and deduce a relationship between the extension of the spring and the force applied. [3]

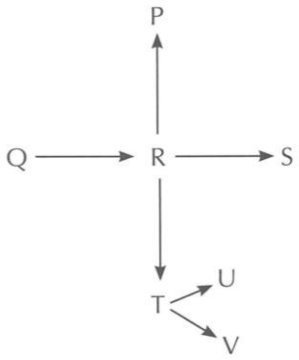
2. You have been given the following materials:



Design an experiment to test the following hypothesis:

'Water is needed for an acid to exhibit acidic properties' [5]

3. Consider this feeding relationship where the letters represent organisms.



Which of the following population changes in the other organisms would result in an **increase in the population of T**? Put a tick (✓) or cross (✗) in the box provided for each case. [5]

(a) A decrease in population of Q ☐

(b) An increase in population of P ☐

(c) A decrease in population of V ☐

(d) An increase in population of S ☐

(e) An increase in population of R ☐