Name	Index Number	Class	Parent's Signature

FUCHUN SECONDARY SCHOOL
END OF YEAR EXAMINATION (2021)
SECONDARY TWO EXPRESS

LOWER SECONDARY SCIENCE

Friday, 8 October 2021
2 hours

Candidates answer on the Question Paper.

Additional Materials: Multiple Choice Answer Sheet

READ THESE INSTRUCTIONS FIRST

Write your name, index number and class on all the work you hand in.
You may use an HB pencil for any diagrams, graphs, tables or rough working.
Write in dark blue or black pen.
Do not use staples, paper clips, glue or correction fluid.
The use of an approved scientific calculator is expected, where appropriate.

Section A

There are **thirty** questions in this section. Answer **all** questions. For each question, there are four possible answers **A**, **B**, **C** and **D**.
Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

Section B

Answer **all** questions.
Write your answers in the spaces provided on the question paper.

Section C

Answer **all** questions in the spaces provided on the question paper.

The number of marks is given in bracket [ ] at the end of each question or part question.
You may lose marks if you do not show your working or if you do not use appropriate units.

A copy of the Periodic Table is provided.

For Examiner's Use	
Section A	/ 30
Section B	/ 40
Section C	/ 30
TOTAL	/100

Setter: Mrs. Wong – Ng Hsuen Huey

This document consists of **32** printed pages and **no** blank page.

Section A

Choose the correct answer and shade your choice in soft pencil on the Answer Sheet.

1. Which are the examples of matter?

I air
II light
III sound
IV water

A I and IV only
B II and III only
C I, II and III
D II, III and IV

2. Which statement **best** shows that blue copper (II) sulfate solution is a mixture?

A Copper (II) sulfate is made of three elements.
B Copper (II) sulfate solution is blue in colour.
C No heat or light is involved when copper (II) sulfate is dissolved in water.
D When heated strongly, the blue solution leaves behind a white residue.

3. Which statement is **true** about the Periodic Table?

A Elements in the Periodic Table are categorised into seven groups.
B Elements in the Periodic Table are arranged according to their nucleon number.
C Elements with similar chemical properties are placed in the same group.
D The properties of the elements in the Periodic Table are changed gradually from non-metals to metals as they move from left to right of a period.

4. The table shows the colours of four solids (**W**, **X**, **Y** and **Z**) and their solubilities in water.

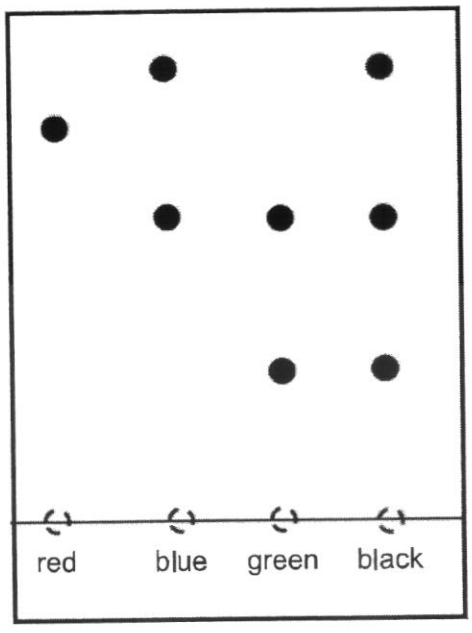
solid	colour	solubility
W	green	insoluble
X	green	soluble
Y	white	insoluble
Z	white	soluble

A mixture containing two of the solids is added to excess water, stirred and filtered.
A colourless filtrate and a green residue are obtained.

Which **two** solids are present in the mixture?

A **W** and **X**
B **W** and **Z**
C **X** and **Y**
D **X** and **Z**

5. The diagram below shows the results of a chromatography experiment carried out using four different coloured dyes in water.



What can you deduce from the results shown above?

A The black dye is made up of green and blue dyes.
B The blue dye is made up of green and black dyes.
C The green dye is made up of a compound.
D The red dye is insoluble.

6. Which molecule has the greatest number of atoms?

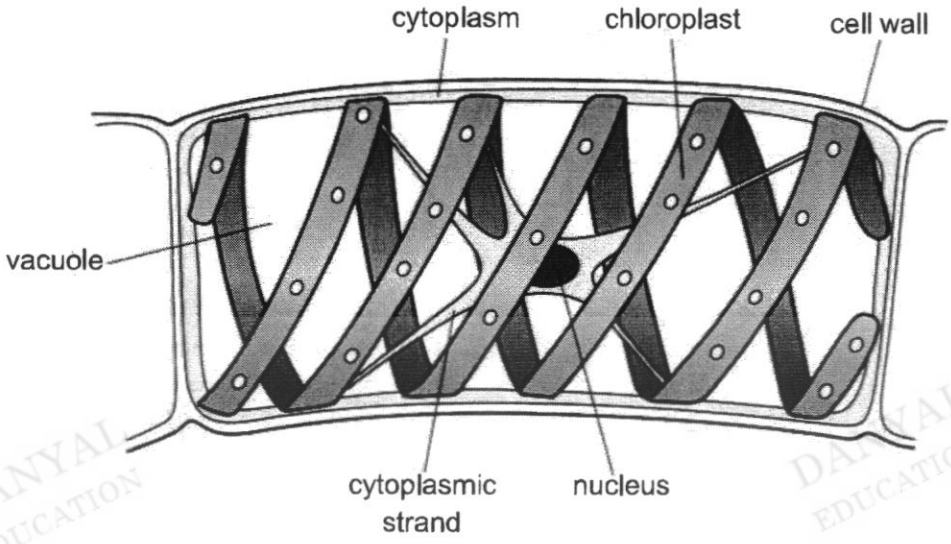
A C_6H_6
B $K_2Cr_2O_7$
C $KMnO_4$
D XeF_4

7. Cystic fibrosis is a genetic disorder that is passed down from one generation to the next. It causes persistent lung infections and limits a person's ability to breathe over time.

Which structure is responsible for the inheritance of this disorder from the person's parents to the child?

A chromosome
B cytoplasm
C mitochondrion
D ribosome

8. The diagram shows a single cell from an organism called *Spirogyra*.



Which structures in *Spirogyra* are also found in root hair cells?

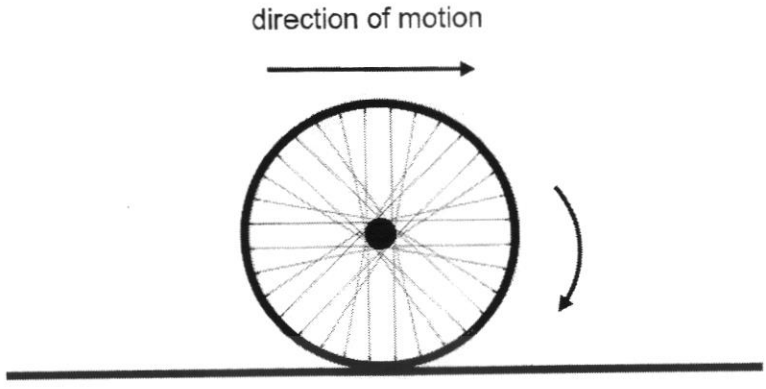
Legend:
✓ yes
✗ no

	cell wall	chloroplast	cytoplasm	nucleus	vacuole
A	✓	✓	✓	✓	✓
B	✓	✗	✓	✓	✓
C	✓	✓	✗	✗	✓
D	✗	✓	✓	✓	✗

9. A force was applied to hammer a nail into a wall. The sharp end of the nail has a cross sectional area of 0.0005 m^2. If the pressure exerted on the sharp end of the nail is 300 000 Pa, what was the force applied to hammer the nail?

A 0.15 N
B 60 N
C 150 N
D 6 000 000 000 N

10. The figure shows a bicycle wheel moving right by rotating in a clockwise direction.



In which direction is the frictional force acting on the bicycle wheel?

A ←

B →

C ↑

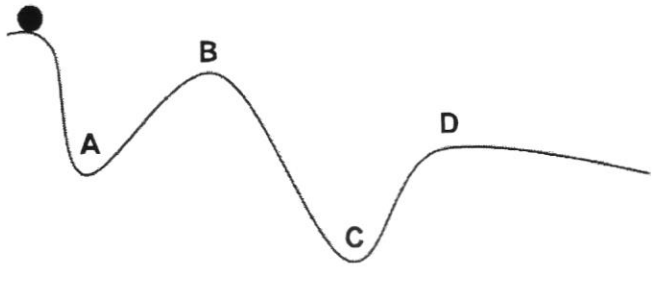
D ↓

11. During a Vertical Marathon, a climber climbs stairs to the rooftop and his time is recorded. Which information are needed to calculate the work done by the climber?

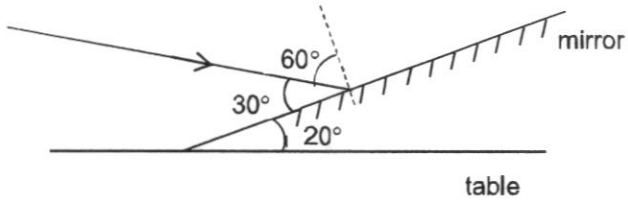
I average speed of climb
II height of building
III weight of climber

A I and II only
B I and III only
C II and III only
D I, II and III

12. A marble is being released from rest at the top of a slope as shown in the diagram below. At which point will its kinetic energy be the **maximum**?



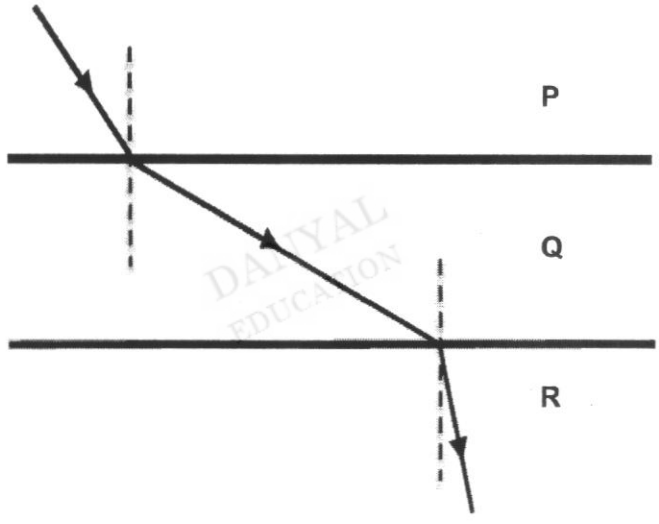
13. A ray of light is directed onto a mirror that is tilted at an angle of 20° from the table as shown in the diagram.



What is the angle of reflection?

A 20° **B** 30° **C** 50° **D** 60°

14. The ray diagram shows the path of light as it travels through three media **P**, **Q** and **R**.



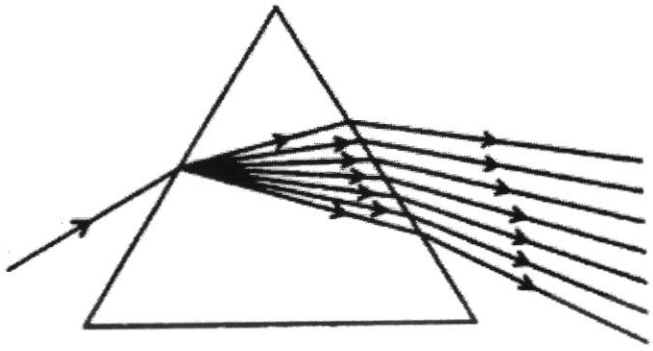
Which statement correctly describe about the optical densities of the three media?

A **Q** is denser than **P**.
B **R** is less dense than **Q**.
C **R** has the largest density.
D **P** has the lowest density.

15. A boy is standing 2.0 m in front of a plane mirror. His cat is sitting 3.0 m behind him. If the cat walks 1.5 m towards the mirror, how far is the boy away from the cat's image in the mirror?

A 3.5 m
B 5.0 m
C 5.5 m
D 7.0 m

16. The diagram below shows the dispersion of light through a prism.

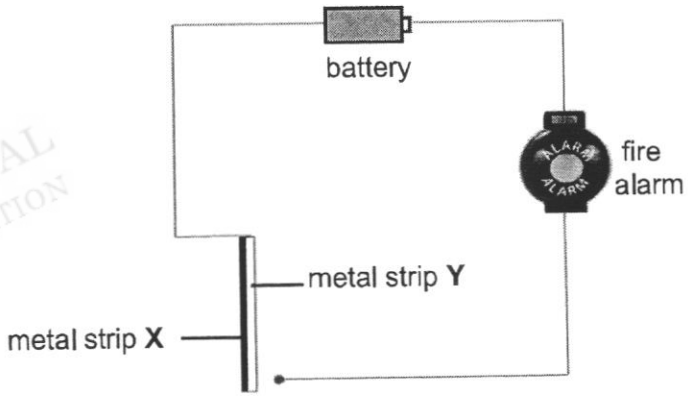


Which statements regarding the dispersion of light are correct?

I Dispersion of light is a result of refraction.
II Light is separated because the speed of light decreases.
III Only triangular prism can separate the light.
IV When the light is separated, they cannot be recombined.

A I and II
B I and III
C II and III
D III and IV

17. The diagram shows a bimetallic strip used in a fire alarm.



Which situation will result in the ringing of the fire alarm bell in the event of a fire?

A when metal **X** expands at the same rate as metal **Y**
B when metal **X** expands more than metal **Y**
C when metal **Y** expands more than metal **X**
D when the wires contract and becomes shorter

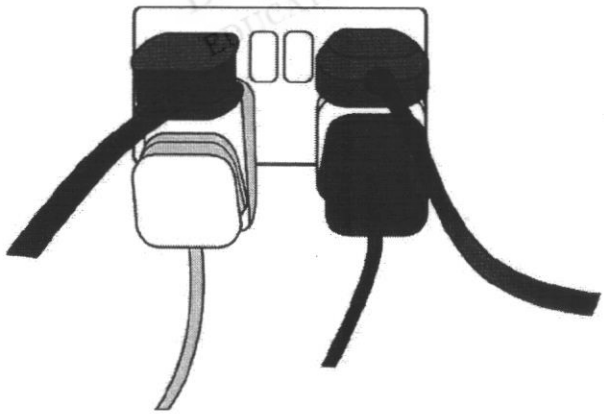
18. Aluminium foils are often used to wrap food to be cooked in barbecue fire. The aluminium has a shiny side and a dull side. How should the aluminium foil be wrapped around the food and why?

A The dull side should be on the inside because it is a better conductor of heat than the shiny side.
B The dull side should be on the inside because it is a better absorber of radiation.
C The shiny side should be on the inside because it allows convection current to be set up.
D The shiny side should be on the inside because it is a good reflector of radiation and can reflect the trapped heat back into the food.

19. An electric heater has a power rating of 1500 W. If the cost of one kilowatt hour (kWh) of electricity is 20 cents, what is the cost of using the heater for 7 hours?

A $ 0.30
B $ 1.40
C $ 2.10
D $ 10.50

20. The diagram illustrates an overloaded wall socket. This is considered an electrical hazard, which can lead to a fire.



Which statement **best** explains why this can cause a fire?

A The current will be too large.
B The fuse will blow.
C There will be short circuit.
D The total voltage will increase.

21. When heated, copper(II) carbonate undergoes the following reaction.

copper(II) carbonate → copper(II) oxide + carbon dioxide

Which type of reaction does the word equation represent?

A combination
B combustion
C decomposition
D oxidation

22. Hydrochloric acid can react with both magnesium metal and magnesium carbonate. In what way are both the reactions similar?

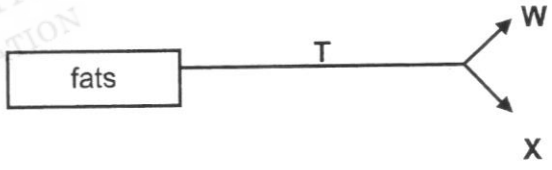
A Both reactions produce the same gas which extinguishes the lighted splint with "pop" sound.
B Both reactions produce the same salt.
C Both reactions produce water as the end product.
D Both reactions require the use of heat energy to proceed.

23. The burning of fossil fuels can release a gas called sulfur dioxide, which is considered to be a pollutant.

Which of the following is a harmful effect of sulfur dioxide on the environment?

A It causes acid rain.
B It causes respiratory problems.
C It contributes to global warming.
D It reduces the rate of photosynthesis.

24. The diagram illustrates the chemical digestion of fats into substances **W** and **X** by enzyme **T**.



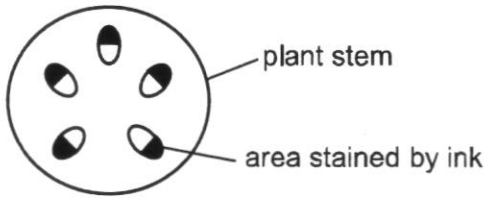
Which row correctly represents **T**, **W** and **X**?

	T	W	X
A	amylase	glucose	amino acids
B	lipase	glucose	fatty acids
C	lipase	glycerol	fatty acids
D	protease	glycerol	amino acids

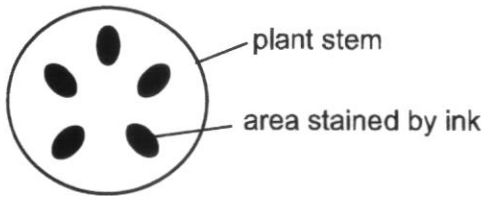
25. A plant shoot is left in a beaker of ink solution for several hours. A section of the stem was then cut.

Which diagram correctly shows the cross-section of the plant stem?

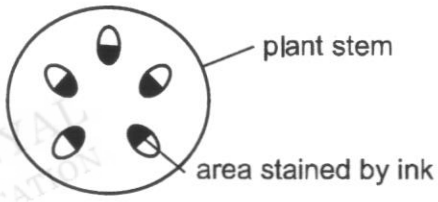
A



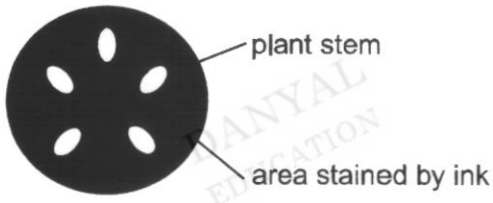
B



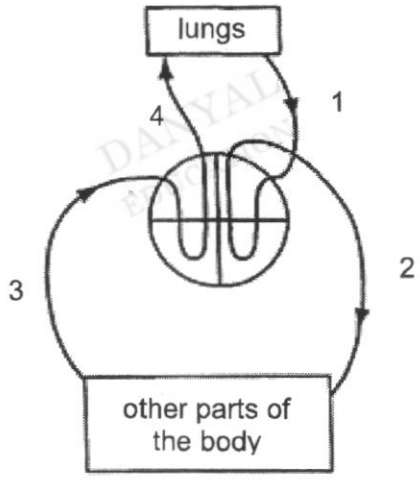
C



D



26. The diagram shows the double circulation of blood.



Which row correctly identifies the blood vessels labelled 1 to 4?

	1	2	3	4
A	artery	artery	vein	vein
B	artery	vein	artery	vein
C	vein	artery	vein	artery
D	vein	vein	artery	artery

27. The blood counts of a healthy man (**X**) and one with a blood disorder (**Y**) are shown below.

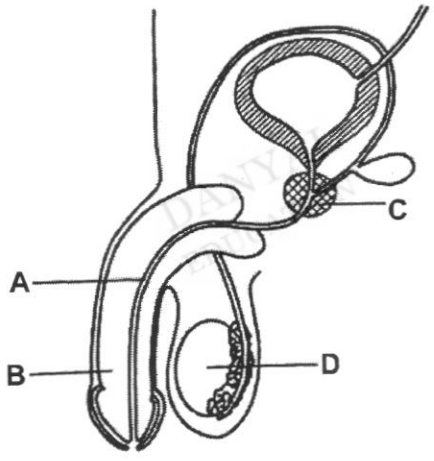
	blood counts of man **X**	blood counts of man **Y**
white blood cells	8×10^9	3×10^5
red blood cells	5×10^{12}	5.5×10^{12}
platelets	300	310

Which is the likely conclusion that can be drawn from the data about man **Y**?

A Individual **Y** is unable to clot his blood.
B Individual **Y** is very vulnerable to infections.
C Individual **Y** is likely to suffer from diabetes.
D Individual **Y** is suffering from low blood pressure.

28. The diagram shows part of the male reproductive system.

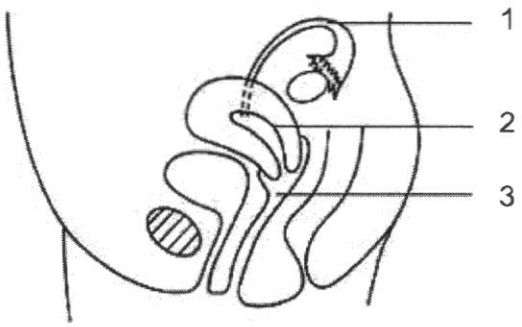
Which part transports sperms and urine out of the male body?



29. Which statement about AIDS is **incorrect**?

A AIDS can be passed from an infected mother to her child during pregnancy.
B AIDS can be spread by kissing an infected person.
C AIDS can be spread through blood transfusion from an infected person.
D Use of spermicide during sexual intercourse cannot prevent the spread of AIDS.

30. The diagram shows the side view of the female reproductive system.



In which part, do fertilisation and implantation take place?

	fertilisation	implantation
A	1	2
B	1	3
C	2	1
D	3	2

Section B

Answer **all** questions in the spaces provided.

1. Vernier calipers are used to measure lengths.
Calipers are used to measure the external diameter of the boiling tube as shown in Fig. 1.1.

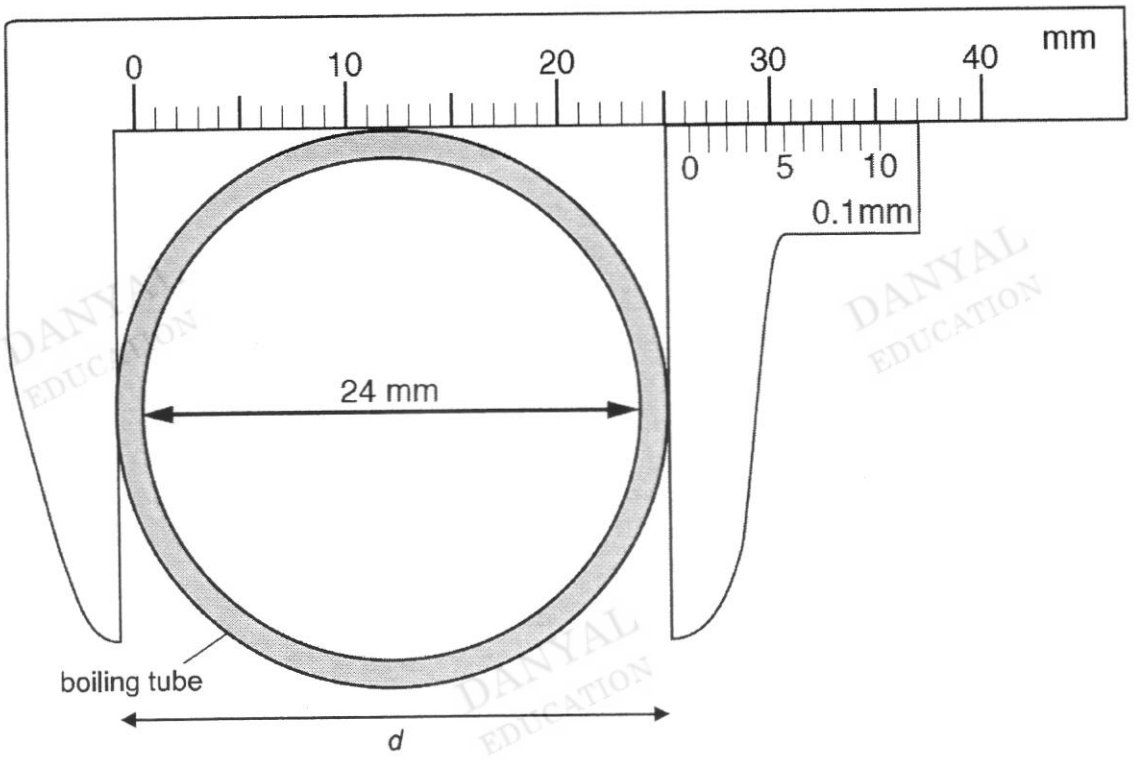


Fig. 1.1

(a) The glass boiling tube has an internal diameter of 24 mm.

(i) Determine the external diameter *d* of the boiling tube.

d = ... mm [1]

(ii) Calculate the thickness *t* of the glass wall of the boiling tube.

t = ... mm [1]

(b) A measuring cylinder contains water as shown in Fig. 2.2. The boiling tube is then placed in the measuring cylinder as shown in Fig. 2.3.

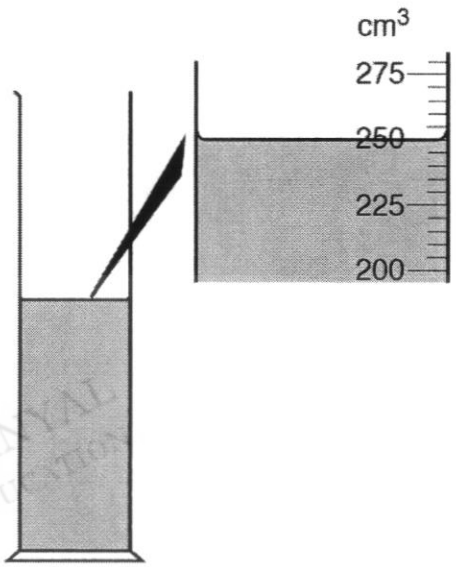


Fig. 2.2

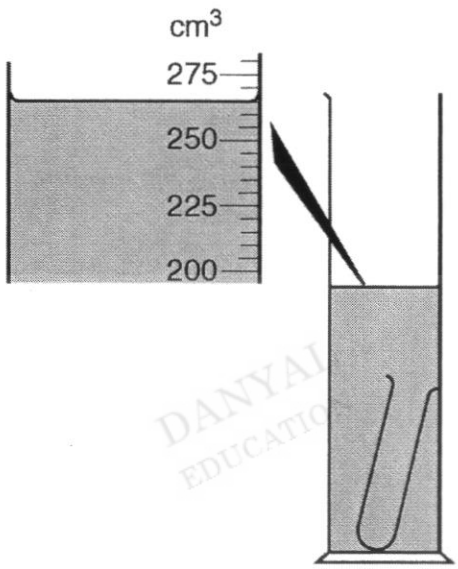


Fig. 2.3

(i) Determine the volume V of glass used to make the boiling tube.

V = ... cm^3 [1]

(ii) The mass of the boiling tube is 33.5 g.
Calculate the density D of the glass used to make the boiling tube.

D = ... g/ cm^3 [1]

2. Fig. 2.1 shows representations of elements, compounds and mixtures.

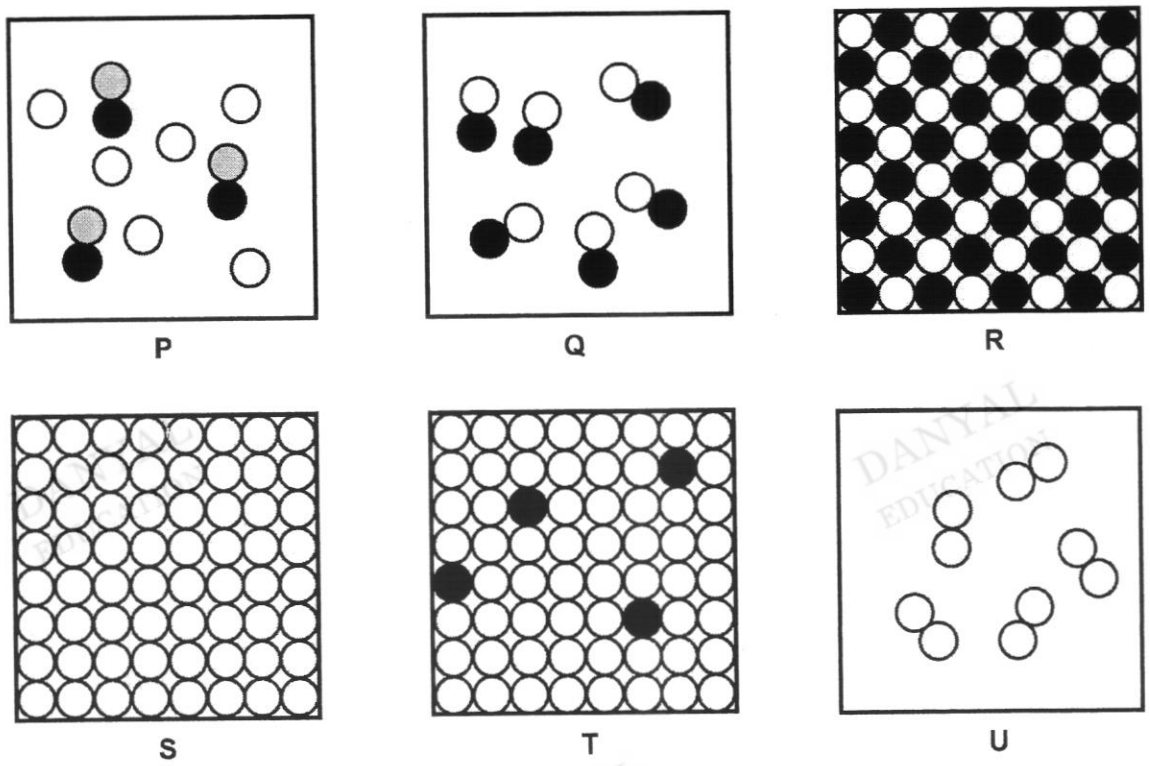


Fig. 2.1

Choose the letter(s) on the diagram which represent(s)

(a) a solid element, ...

(b) a compound, ...

(c) a mixture of two gases, ...

(d) oxygen molecules. ..... [4]

3. Fig. 3.1 represents the nuclei of five different atoms **F**, **G**, **H**, **J** and **K**. The letters do not represent the actual symbols of the elements.

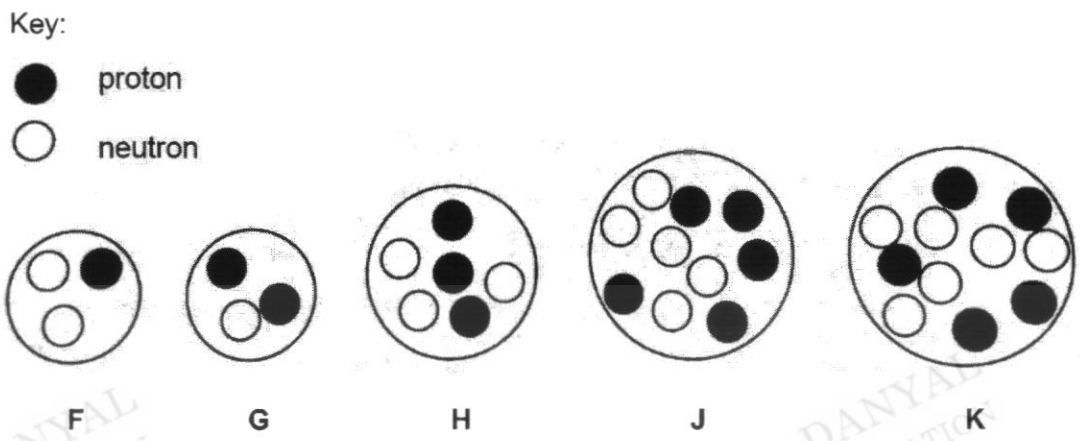


Fig. 3.1

Choose the letter which represents

(a) an atom which has a nucleon number of 6, ...

(b) two atoms which represent the same element, ...

(c) an atom which has 2 electrons, ...

(d) a hydrogen atom. ..... [4]

(e) The protons in the atom carry positive charges.

Explain why an atom has no overall charge.

.....

.....

..... [1]

4. A man is climbing a mountain as shown in Fig. 4.1.

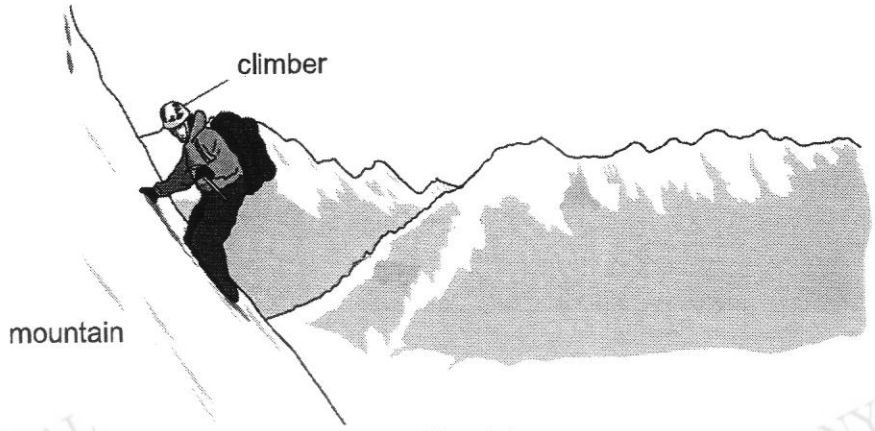


Fig. 4.1

(a) Complete the main energy conversion which takes place when the man climbs from the valley to the top of the mountain.

chemical energy → [ ] → [ ] [1]

(b) On the mountain, the climber sees some ice melting.

(i) State the meaning of the term *melting point*.

.....

..... [1]

(ii) When ice melts, it forms liquid water.
Describe how the arrangement and movement of water particles change during melting.

.....

.....

.....

.....

..... [2]

(iii) Is the melting of ice a chemical or physical change? Explain your answer.

.....

..... [1]

5. Fig. 10.1 shows a simple circuit set up to investigate the electrical properties of a lamp.

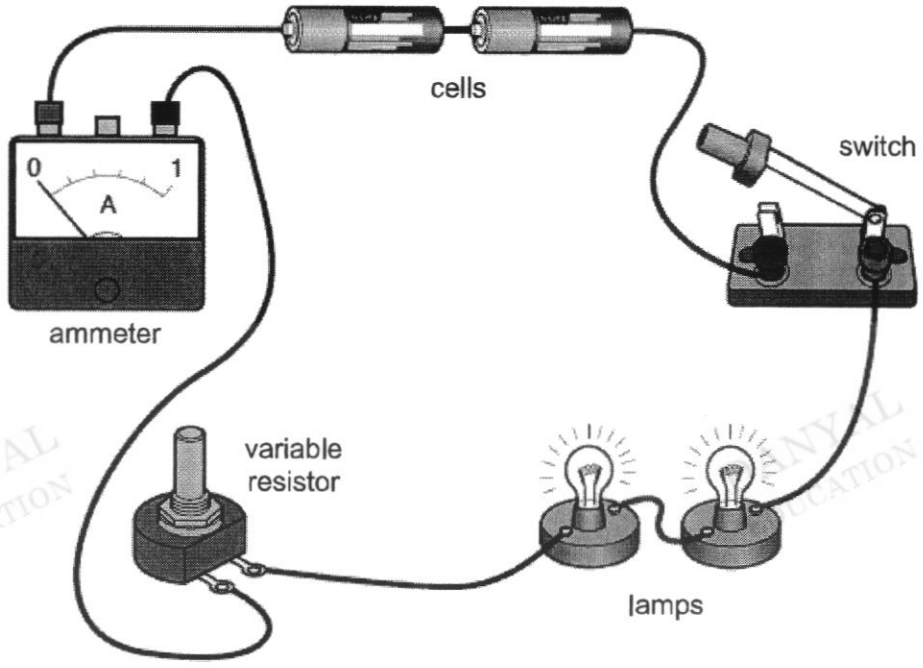


Fig. 5.1

(a) On the space provided in Fig. 5.2, use the correct circuit symbols to complete the circuit diagram for the circuit arrangement shown in Fig. 5.1.

Fig. 5.2

[3]

(b) The resistance of the variable resistor is reduced.

State the effect this will have on the brightness of the two lamps.

Give a reason for your answer.

.....

.....

..... [1]

(c) A student investigates the current through one of the lamps as she varies the potential difference or voltage across the lamp.

(i) On the circuit in Fig. 5.2, draw the symbol of the electrical component that will allow the potential difference across the lamp to be measured. [1]

(ii) State the current and the potential difference shown on the meters in Fig. 5.3.

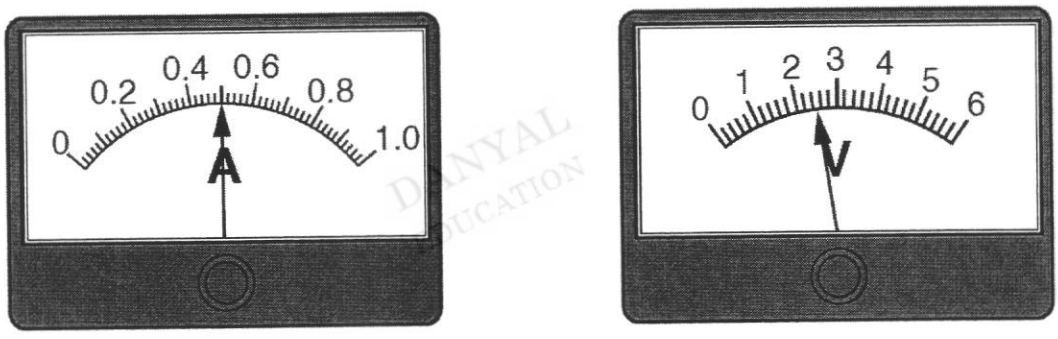


Fig. 5.3

current = ... A

potential difference = ... V [2]

(d) The student carries out an experiment.
Fig. 5.4 shows her results are plotted as a graph.

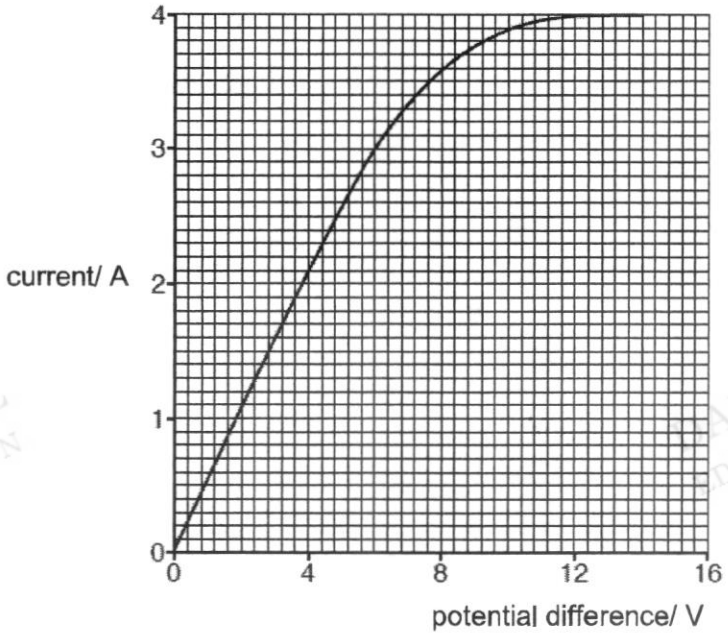


Fig. 5.4

Use the graph to describe how the current through the lamp filament changes as the potential difference across the filament increases.

.....

.....

..... [1]

6. Oxygen and carbon dioxide are exchanged between the air sacs in the lungs and their neighbouring blood vessel.

Fig. 6.1 shows an air sac with a neighbouring blood vessel.

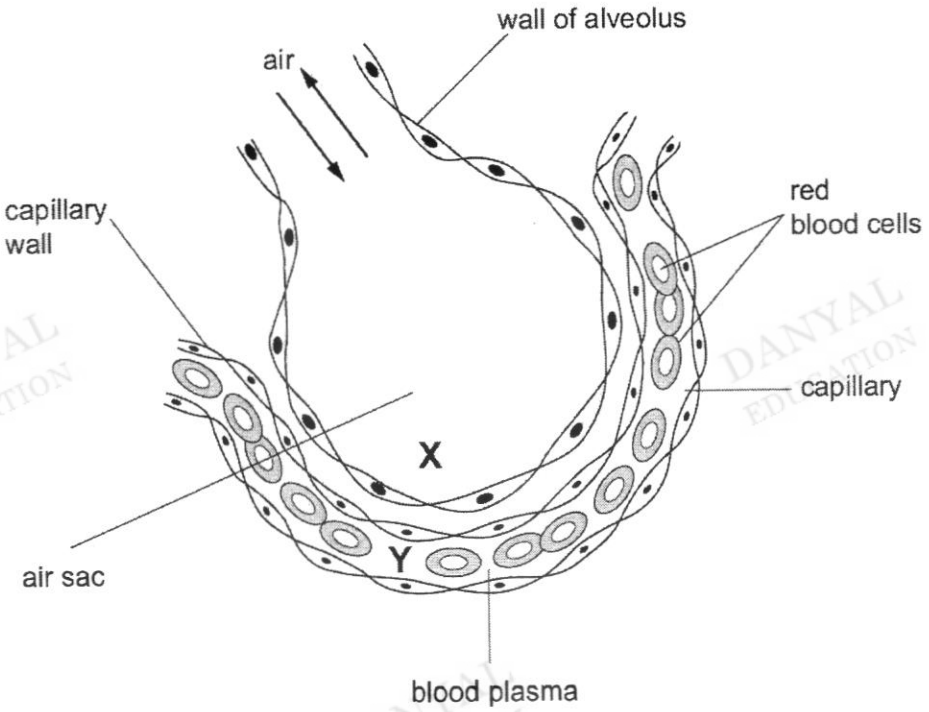


Fig. 6.1

(a) Name the process by which oxygen and carbon dioxide molecules move between the air sac and the blood vessel.

.....[1]

(b) Describe and explain the net movement of oxygen molecules between **Y** and **X**, through the process mentioned in **(a)**.

.....

.....

.....

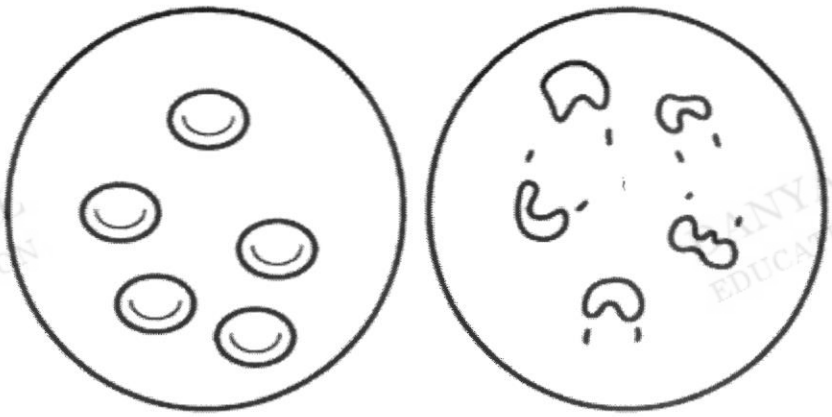
.....[2]

(c) Red blood cells from humans are placed into two test-tubes **A** and **B**.

Test-tube **A** contains a dilute salt solution and test tube **B** contains distilled water.

A sample is taken from each test-tube and viewed using a microscope.

The results are shown in Fig. 6.2.



red blood cells in test tube **A**

red blood cells in test tube **B**

Fig. 6.2

(i) When the samples are examined under microscope, it is observed that the red blood cells in test tube **A** remain circular biconcave in shape, but the red blood cells in test tube **B** become burst. This is caused by a process known as *osmosis*.

Define *osmosis*.

.....

.....

..... [1]

(ii) Explain why the red blood cells in test-tube **B** burst.

.....

.....

.....

..... [2]

7. Fig. 7.1 shows a diagram of the alimentary canal.

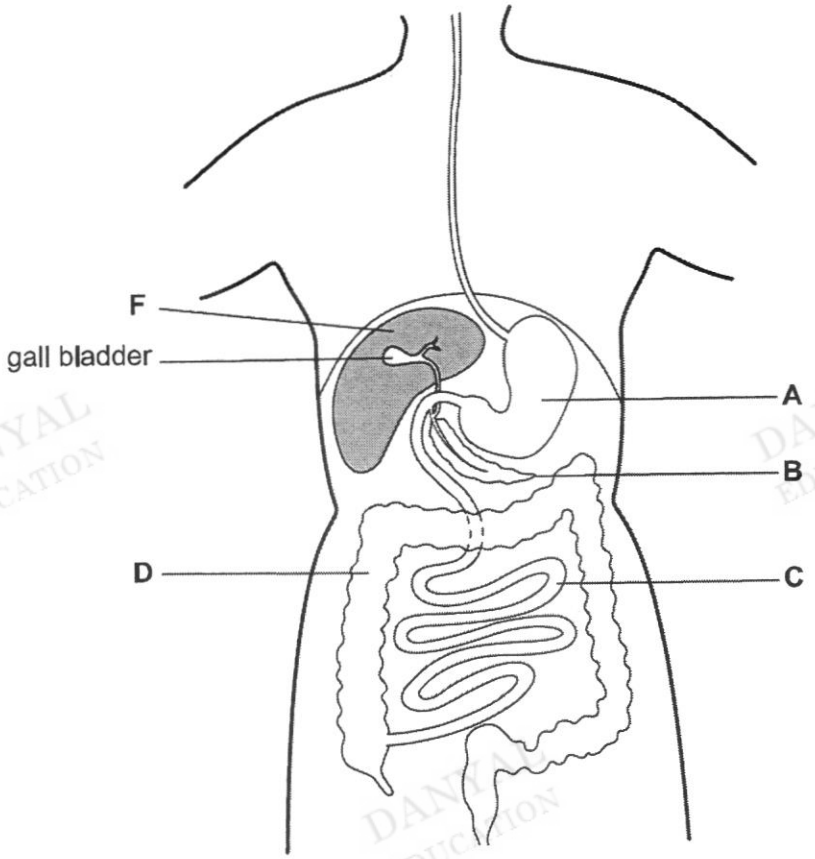


Fig. 7.1

(a) Use the letter(s) in Fig. 7.1 to complete Table 7.1.

Table 7.1

function	organ(s)
absorption of water and mineral salts	.....
digestion of protein	..... and .....

[2]

(b) Gallstones are hard crystals which can sometimes form abnormally in gall bladder which is shown in Fig. 7.1. They can cause severe pain and blockage. As a result, surgeons often remove gall bladder to reduce the risk of infections.

Explain how the removal of gall bladder will affect the digestion of fats.

.....

.....

.....

.....

..... [2]

(c) The fitness trainers always take protein powder as their pre- and post-workout supplement.

Describe the digestion and absorption of protein molecules along the human alimentary canal.

.....

.....

.....

.....

.....

.....

..... [4]

Section C

Answer **all** questions in the spaces provided.

8. Fig. 8.1 shows the apparatus used in a titration experiment to add solution of hydrochloric acid to potassium hydroxide.

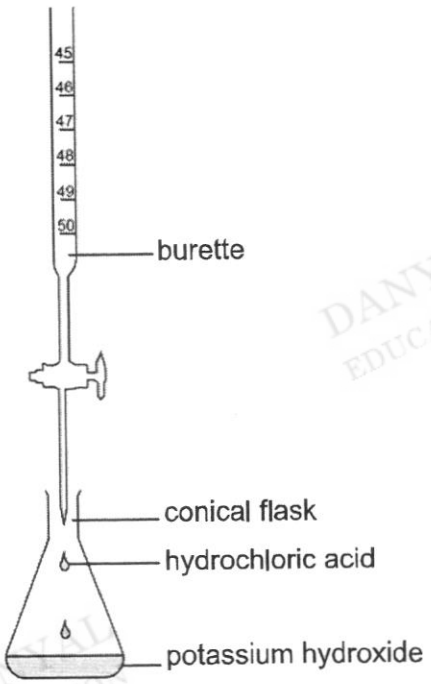


Fig. 8.1

20.0 cm^3 of potassium hydroxide solution is transferred to a conical flask.

The temperature of this solution is measured and recorded.

A 2.0 cm^3 portion of dilute hydrochloric acid is run into the conical flask. The mixture is stirred and the **highest** temperature reached is measured and recorded.

Seven further 2.0 cm^3 portions of hydrochloric acid are added. Each time the mixture is stirred and the temperature is measured and recorded.

(a) Name the apparatus that should be included in the setup to measure the results.

.....[1]

(b) The results for this experiment are shown in Table 8.1.

Table 8.1

volume of acid added/ cm^3	0.0	2.0	4.0	6.0	8.0	10.0	12.0	14.0
temperature of the mixture/ °C	21.0	24.2	27.4	30.7	32.9	31.2	29.4	27.6

Four points have been plotted on the grid in Fig. 8.2 and a best-fit line has been drawn.

(i) On the grid, plot the remaining four points. Mark each point with a cross (x). [1]

(ii) Draw a best-fit line for these four points. Extend this line to intersect (cross) the line already drawn. [1]

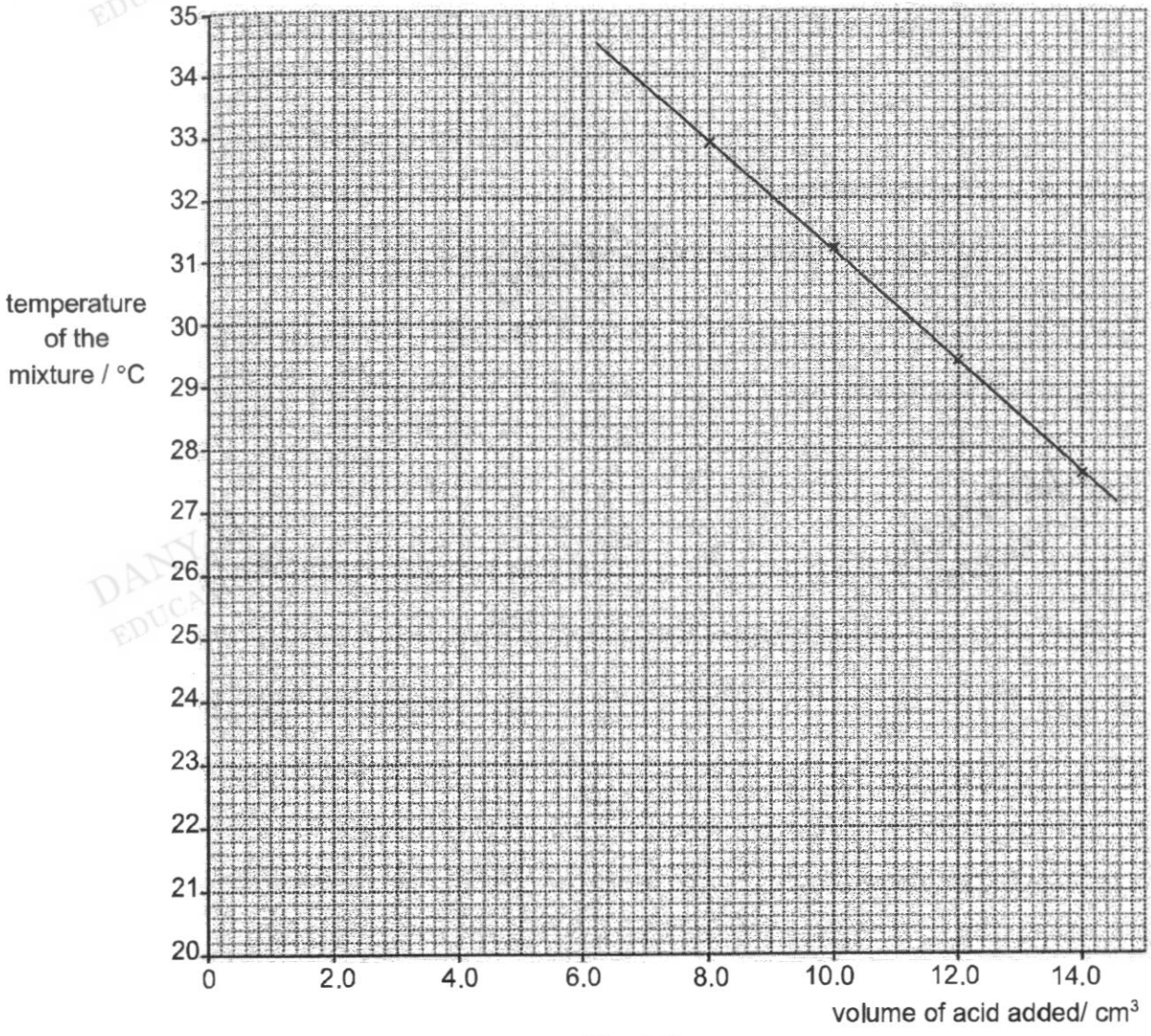


Fig. 8.2

(c) The acid and the alkali exactly neutralise each other at the point where the two graph lines intersect (cross).

(i) From your graph, determine the volume of hydrochloric acid required to exactly neutralise the potassium hydroxide solution.

volume = ... cm^3 [1]

(ii) Complete the word equation to show the reaction between hydrochloric acid and potassium hydroxide.

hydrochloric acid + potassium hydroxide ⟶ [ ] + [ ] [2]

(iii) State the pH of the final solution formed at the end of reaction when just enough of acid is added to react exactly with the potassium hydroxide solution.

pH = ... [1]

(d) When excess hydrochloric acid is added to potassium hydroxide, the solution changes from alkaline to acidic.

Describe a test that could be carried out to show that the solution is acidic.

test .....

observation .....

.....

[2]

(e) In this reaction, acid reacts with alkali to form products. State another reaction of acids.

.....

..... [1]

9. **(a)** Fig. 9.1 shows how the thickness of the lining of a woman's uterus changes during her menstrual cycle.

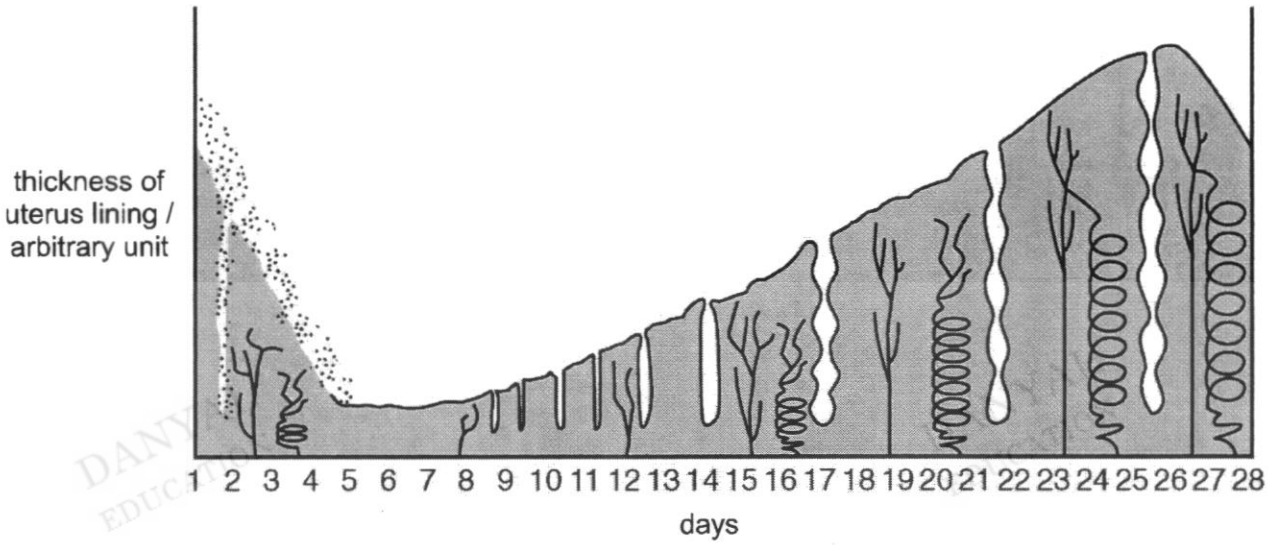


Fig. 9.1

(i) Name the event that occurred from day 1 to 5 in the woman's uterus and describe how this event affects the thickness of uterus lining.

.....

.....

..... [2]

(ii) With reference to Fig. 9.1, describe what happens to the thickness of the uterus lining of the woman between day 14 to day 26. State the role of the uterus lining during this period.

.....

.....

.....

..... [2]

(iii) Describe the difference you would expect after day 26 in Fig. 9.1 if an egg is fertilised during this cycle.

.....

..... [1]

(iv) One method of birth control is to avoid sexual intercourse during a woman's fertile days.

State **two other temporary** methods of birth control.

1 .....

.....

2 .....

.....

[2]

(b) Fig. 9.2 is an electron micrograph showing a sperm cell trying to penetrate through the membrane of an egg cell.

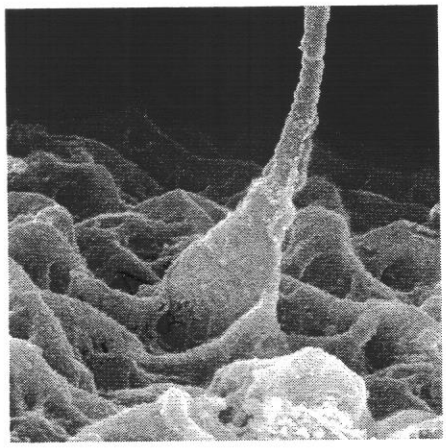


Fig. 9.2

Describe what happens between the event shown in Fig. 9.2 and implantation in the uterus.

.....

.....

.....

.....

.....

.....

.....

[3]

10. **(a)** Four different materials **A**, **B**, **C** and **D** are at room temperature.

They are heated at one end by the same heat source, as shown in Fig. 10.1.

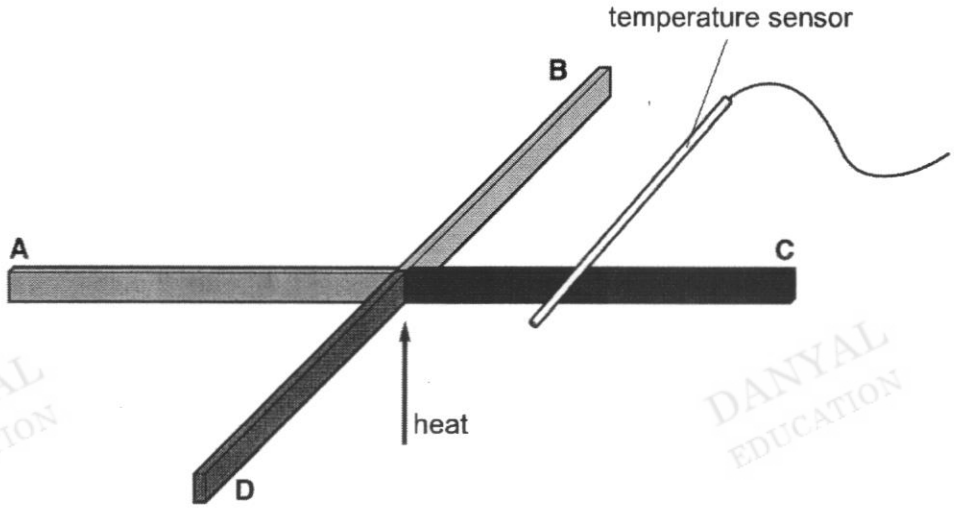


Fig. 10.1

After 2 minutes of heating, temperature sensors are used to measure the temperature at different points along each material. The results are shown in Table 10.1.

Table 10.1

distance from heat source / cm	0.0	5.0	10.0	15.0	20.0
temperature of material **A** / °C	150	126	101	77	52
temperature of material **B** / °C	150	104	58	22	22
temperature of material **C** / °C	150	137	125	112	100
temperature of material **D** / °C	150	87	25	24	23

(i) State which material, **A**, **B**, **C** or **D**, is the **best** thermal conductor. Explain your answer.

material .....

explanation .....

.....

.....

[1]

(ii) Describe one physical change to the materials as they are heated.

.....

..... [1]

(b) Use the results in Table 10.1 to determine the room temperature.

room temperature = ... °C [1]

(c) Another experiment is conducted to compare the thermal properties of materials **A**, **B** and **C**.

The apparatus provided is shown in Fig. 10.2.

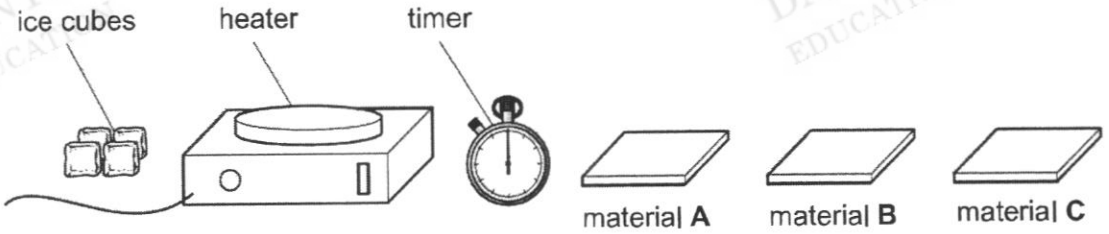


Fig. 10.2

Describe an experiment using the apparatus in Fig. 10.2, to find out which material is the best thermal conductor.

.....

.....

.....

.....

.....

..... [3]

(d) Fig. 10.3 shows a metal pan containing water standing on a hot plate.

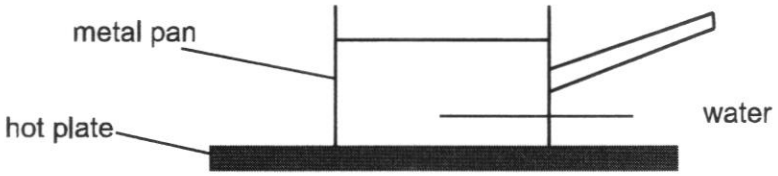


Fig. 10.3

Explain how the processes of conduction and convection are involved in heating the water in the metal pan.

conduction .....

.....

.....

convection .....

.....

.....

[4]

End of Paper

MARK SCHEME
2E Science End-Of-Year Exam (2021)

Section A:

1	2	3	4	5	6	7	8	9	10
A	**C**	**C**	**B**	**A**	**A**	**A**	**B**	**C**	**B**
11	12	13	14	15	16	17	18	19	20
C	**C**	**D**	**C**	**C**	**A**	**B**	**D**	**C**	**A**
21	22	23	24	25	26	27	28	29	30
C	**B**	**A**	**C**	**C**	**C**	**B**	**A**	**B**	**A**

Section B and C:

QN	Question	Remarks
1(a)(i)	26.2 (mm) ;	1
1(a)(ii)	(26.2 – 24 or 2.2) 1.1 (mm) ; allow e.c.f	1
1(b)(i)	15 (cm^3) ;	1
1(b)(ii)	(ρ)= m ÷ v / 33.5 ÷ 15 ; 2.23 ; allow e.c.f	1
2	**(a)** S; **(b)** Q/R; **(c)** P; **(d)** U;	4
3	**(a) H**; **(b) J** and **K**; **(c) G**; **(d) F**;	1 1 1 1
3	**(e)** equal numbers of protons and electrons / equal numbers of positive and negative charges ;	1
4(a)	Kinetic Energy → Gravitational potential energy;	1
4(b)(i)	temperature + solid changes into liquid;	1

<table>
<tr><td>4(b)(ii)</td><td>particles <u>gain energy</u> and <u>vibrate more vigorously/ faster</u>;
particles are <u>randomly arranged</u> / <u>irregular</u> arrangement;
particles are <u>sliding past one another</u> ;</td><td>max 2</td></tr>
<tr><td>4(b)(iii)</td><td>physical change + reversible/ no new substance is formed;</td><td>1</td></tr>
<tr><td>5(a)</td><td>correct symbol for switch (opened) ;
correct symbol for ammeter (in series with lamp);
correct symbols of lamp (in series);
correct symbol for variable resistor ;
all shown components connected in series, any order ;</td><td>max 3</td></tr>
<tr><td>5(b)</td><td>(total resistance less) so current increases ;
(increase – no mark)</td><td>1</td></tr>
<tr><td>5(c)(i)</td><td>voltmeter correctly connected in parallel with one of the lamps;</td><td>1</td></tr>
<tr><td>5(c)(ii)</td><td>(current =) 0.5 ;
(potential difference =) 2.5 ;</td><td>1
1</td></tr>
<tr><td>5(c)(iii)</td><td><u>current increases</u> with potential difference (until 12 V);</td><td>1</td></tr>
<tr><td>6(a)</td><td>diffusion ;</td><td>1</td></tr>
<tr><td>6(b)</td><td>lower concentration of oxygen in blood (plasma); ORA
oxygen diffuse from air sacs into blood (red blood cells)/ X to Y;</td><td>1
1</td></tr>
<tr><td>6(c)(i)</td><td>net movement of water molecules + from a region of higher water potential to another region of lower water potential + across partially permeable membrane;

A concentration of water</td><td>1</td></tr>
<tr><td>6(c)(ii)</td><td>higher water potential in distilled water than red blood cells ; ORA
<u>water molecules</u> enter cell <u>by osmosis</u> ;

allow: expand / without cell wall</td><td>1
1</td></tr>
<tr><td>7(a)</td><td><table><tr><th>function</th><th>organ(s)</th></tr><tr><td>reabsorption of water and mineral salts</td><td>D;</td></tr><tr><td>digestion of protein</td><td>A and C;</td></tr></table></td><td>2</td></tr>
</table>

7(b)	Fats cannot be emulsified; digestion of fat will be slowed down / will take a longer time ; **R** fats cannot be digested	1 1
7(c)	protein is broken down into shorter polypeptide chain + in stomach; by protease; polypeptide chain is broken down into amino acids + in small intestine; absorbed in the small intestine/ into bloodstream;	4
8(a)	Thermometer; Reject spelling error	1
8(b)(i)	All 4 points plotted correctly;	1
8(b)(ii)	Straight line cutting through all 4 points + intersect with existing line;	1
8(c)(i)	7.6 cm^3;	1
8(c)(ii)	potassium chloride; water;	1 1
8(c)(iii)	(pH) 7;	1
8(d)	Add Universal indicator; Solution turns red; OR Use blue litmus paper; (blue) litmus paper turns red; OR Add red cabbage indicator; Solution turns red;	2
8(e)	Acid reacts with metal to form salt and hydrogen gas; Acid reacts with metal carbonate to form salt, carbon dioxide and water; **A** word equations	max 1
9(a)(i)	menstruation ; decrease in thickness ; **A** discharge of uterine lining **R** bleeding	1 1
9(a)(ii)	increase in thickness / become thickest (on day 26) ; preparing the uterus for the implantation of embryo ; **A** foetus, zygote	1 1

9(a)(iii)	remained thick ;	1
9(a)(iv)	Any two below: chemical / spermicide ; hormonal / (contraceptive) pill ; condom / femidom ; diaphragm / intra-uterine device ;	2
9(b)	fertilisation occurs / nuclei (of sperm and egg) + fuse / join; zygote formed ; fertilised egg/ zygote divides repeatedly (to form embryo); ball of cells / embryo / zygote / fertilised egg, moves down the oviduct / Fallopian tube + to the uterus (for implantation);	3
10(a)(i)	**C** + faster rate of heat transfer ; **A** longer distance of heat transfer (in 2 minutes)	1
10(a)(ii)	expansion/ increase in size or volume ;	1
10(b)	22 (°C) ;	1
10(c)	put each material between ice cube and heater ; measure time taken for ice to melt ; least time for ice to melt is best conductor ;	1 1 1
10(d)	Conduction: heat transferred from (hot plate to) metal pan to water; particles colliding with neighbouring particles; Convection: hot water becomes less dense + rises + cold water becomes denser + sink; convection current heats up all the water in the pan;	 1 1 1 1