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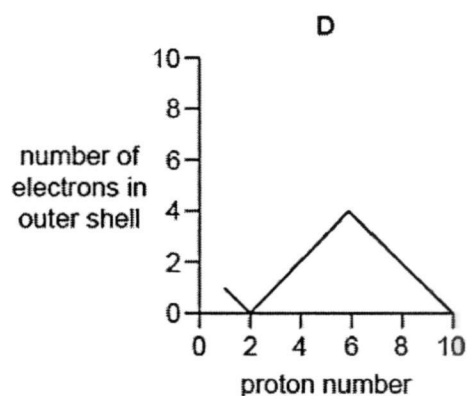
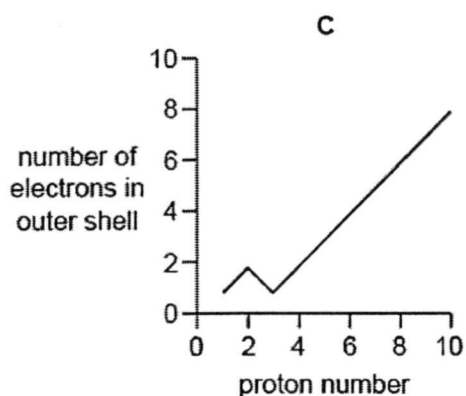
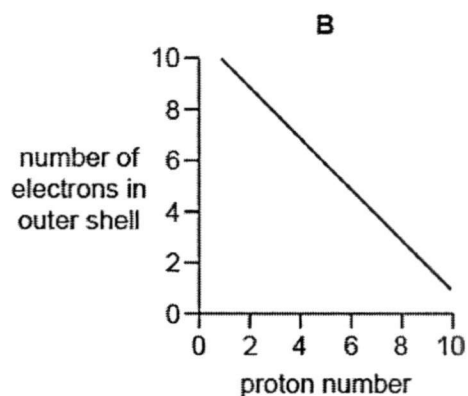
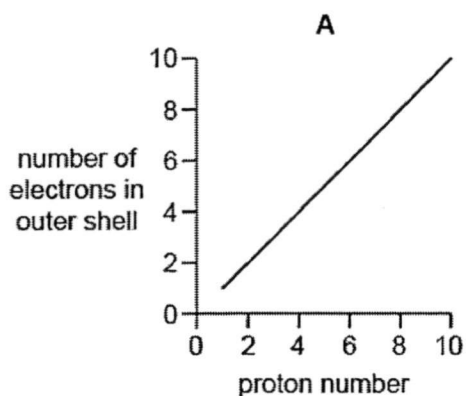
Section A

Answer **all** questions in this section.

Record your answer in the answer table provided.

Question	1	2	3	4	5	6	7	8	9	10
Answer										

- 1 Which graph shows the number of electrons in the valence shell of an atom, plotted against the proton number of the first ten elements in the Periodic Table?



- 2 In which one of the following sets do all three particles have the same number of electrons?

A	Cl^-	Br^-	I^-
B	F^-	Mg^{2+}	Be^{2+}
C	K^+	Ca^{2+}	Cl^-
D	Na^+	Al^{3+}	Ar

- 3 If calcium atom and C^{1-35} isotope are used to produce the compound calcium chloride, calculate the number of neutrons in this compound.

A 37 B 38 C 54 D 56

- 4 Which statement(s) is/are true about the elements in Group 0?

- I. All the Group 0 elements cannot combine with other elements to form compounds.
- II. All the Group 0 elements are non-metals.
- III. All the Group 0 elements have 8 electrons in the valence shell.

A I only

B I and II only

C I, II and III

D None of the above

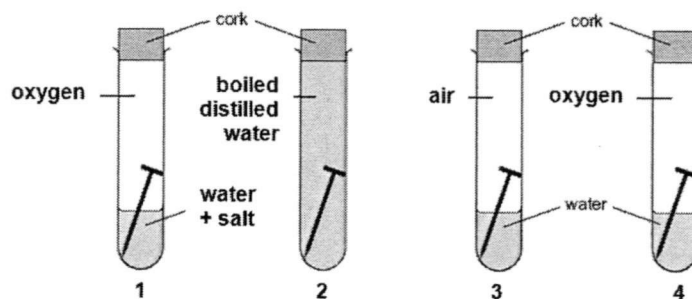
- 5 When substances are mixed, a chemical change may take place. Which of the following does not result in a chemical change?

- A Adding a strip of copper to vinegar.
- B Adding baking powder to hydrochloric acid.
- C Adding calcium carbonate powder to nitric acid.
- D Adding sulfuric acid to aqueous ammonia.

- 6 A student heated some substances in air and recorded the results in the table below. Which substance has undergone a physical change?

	observations		
	before heating	during heating	after heating
A	green solid	brown solid	brown solid
B	reddish-brown solid	reddish-brown solid	black solid
C	silvery grey solid	bright glow emitted	white solid
D	silvery grey solid	silvery grey liquid	silvery grey solid

- 7 An experiment was set up as shown below to investigate the rate of rusting under different conditions.



Predict the order of the test-tubes in which rust would first appear.

- A 1, 4, 3, 2
 B 1, 3, 4, 2
 C 2, 3, 4, 1
 D 3, 4, 1, 2
- 8 A solution has a pH of 14. Which ion must be present in the solution?

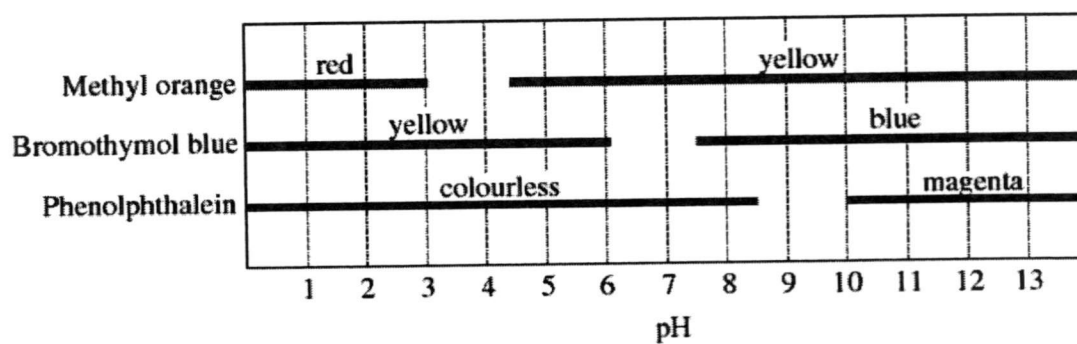
- A hydrogen ion
 B hydroxide ion
 C oxide ion
 D sodium ion

- 9 Solution A gives a dark blue colour with Universal Indicator. When 10 drops of solution W are added to solution A, the colour remains the same. When 10 drops of solution P are added to solution A, the colour turns yellow. When 20 drops of solution P are added to solution A, the colour turns red. Which one of the following shows the possible identities of solutions A, W and P?

	solution A	solution W	solution P
A	acid	alkali	alkali
B	alkali	salt solution	acid
C	alkali	alkali	alkali
D	salt solution	water	acid

- 10 The diagram below shows the colour ranges of three different pH indicators, methyl

orange, bromothymol blue and phenolphthalein.



The pH of a solution is tested with these three pH indicators. The solution is yellow in methyl orange, yellow in bromothymol blue and colourless in phenolphthalein. What is the pH range of the solution?

- A 2.0 to 3.0
- B 4.5 to 6.0
- C 7.5 to 8.5
- D 10.0 to 13.0

Section B

Answer **all** questions in this section.
Write your answers in the spaces provided.

- B1** Fig. B1.1 below shows the nuclei of five different atoms, A, B, C, D and E. The letters do not represent the chemical symbols of elements.

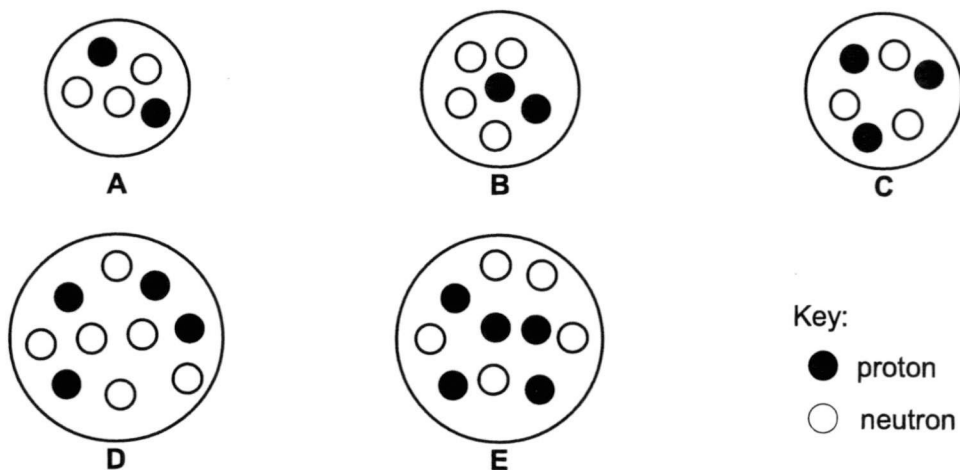


Fig. B1.1

Use the letters A, B, C, D and/or E to answer the following questions.

You may use the letters once, more than once or not at all.

- (a) Which two nuclei belong to atoms which are isotopes? Explain your answer.

.....
.....[2]

- (b) Which nucleus is/are in atoms belonging to Group II of the Periodic Table? Explain your answer.

.....
.....[2]

- B2** A green solid, copper(II) carbonate, was heated strongly as shown in **Fig.B2.1**. A black solid was formed in the boiling tube and a colourless, odourless gas was given off.

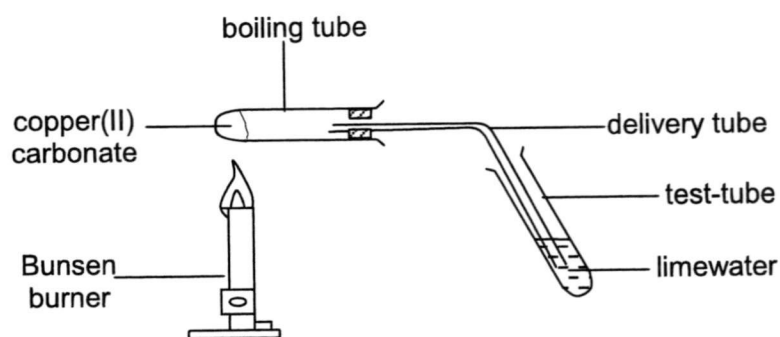


Fig.B2.1

The mass of the boiling tube and its contents are recorded in **Fig.B2.2** below.

Apparatus with/without contents	Mass (g)
Boiling tube	50.0
Boiling tube and contents before heating	62.4
Boiling tube and contents after heating	58.0

Fig.B2.2

- (a) Name the type of reaction taking place.

..... [1]

- (b) Write down the word and chemical equations for the reaction.

Word equation:

.....

[1]Chemical equation:

..... [1]

- (c) Explain, with evidence, why this is a chemical reaction and not a physical change.

.....

.....[2]

- (d) State what will be observed in the limewater during the experiment.

..... [1]

Section C

Answer **at least** one question.

Write your answers in the lined pages provided.

Answer a total of four questions from Section C, one from each booklet. The fourth question can be chosen from any of the booklets.

C1 (a) Potassium combines with sulfur to form potassium sulfide.

(i) State the chemical formulae of potassium and sulfide ions. [1]

(ii) Draw the electronic structure of a sulfide ion. [2]

(b) Fig. C1.1 shows a box of antacid tablets that is commonly used to treat gastric pain. Gastric pain is a condition whereby there is an over-production of hydrochloric acid in the stomach and the tablets are used to reduce the acidity.

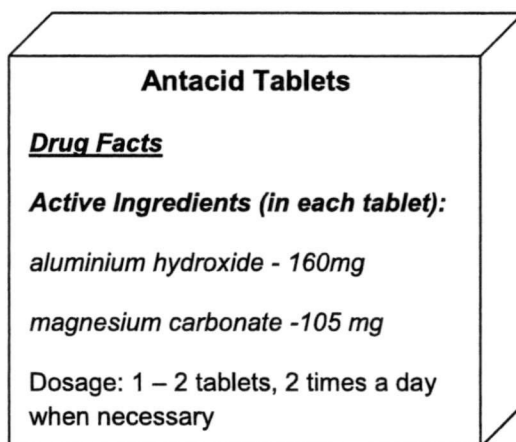


Fig. C1.1

Explain how one of the ingredients in antacid tablets helps to reduce the acidity in the stomach. Write a chemical equation to support your answer. [3]

- (c) Leon carried out an investigation to identify substance X, which is either calcium metal or calcium carbonate. **Fig. C1.2** shows the test he carried out and his observations.

Test	Observation	Conclusion
Place a spatula of substance X into a test-tube and add 5 cm ³ of hydrochloric acid.	Effervescence was observed. Substance X disappeared.	X is calcium metal.

Fig.C1.2

Do you agree with Leon's conclusion? Support your answer with explanation, and if necessary, suggest a modification to the experiment. [4]

- C2 (a)** Upon strong heating, lead(II) nitrate breaks down into lead(II) oxide, nitrogen dioxide gas and oxygen gas.

(i) Construct a balanced chemical equation for the above reaction. [2]

(ii) Why is nitrogen dioxide harmful to the environment?[1]

- (b) Antimony oxide has the chemical formula Sb_2O_3 while potassium phosphate has the chemical formula K_3PO_4 .

Using the information, deduce the chemical formulae of antimony ion and phosphate ion, and the chemical formula of antimony phosphate. [2]

- (c) **Fig. C2.1** shows an experimental setup to study the pH changes as hydrochloric acid is slowly added to 25.0 cm^3 of sodium hydroxide. It is observed that the colour in the flask changes from violet to green, then to red.

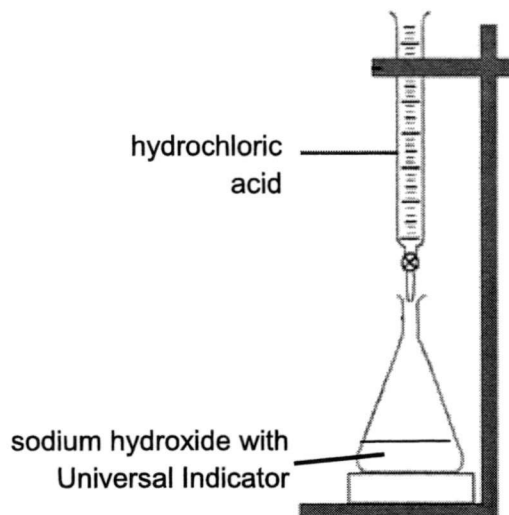


Fig.C2.1

- (i) With reference to substances present in the conical flask, explain the colour changes observed.[3]
- (ii) Explain what colour change(s) would be observed if the experiment is repeated, replacing sodium hydroxide with sodium nitrate.[2]

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

End of Paper

The Periodic Table of the Elements

The Periodic Table of the Elements

Group

I	II	Group										III	IV	V	VI	VII	0					
		1 Hhydrogen1																				2
		key proton (atomic) number atomic symbol name relative atomic mass																				
3	4															5	6	7	8	9	10	
Li lithium 7	Be beryllium 9															B boron 11	C carbon 12	N nitrogen 14	O oxygen 16	F fluorine 19	Ne neon 20	
11	12															13	14	15	16	17	18	
Na sodium 23	Mg magnesium 24															Al aluminium 27	Si silicon 28	P phosphorus 31	S sulfur 32	Cl chlorine 35.5	Ar argon 40	
19	20															31	32	33	34	35	36	
K potassium 39	Ca calcium 40															Ga gallium 70	Ge germanium 73	As arsenic 75	Se selenium 79	Br bromine 80	Kr krypton 84	
37	38															49	50	51	52	53	54	
Rb rubidium 85	Sr strontium 88															In indium 115	Sn tin 119	Sb antimony 122	Te tellurium 128	I iodine 127	Xe xenon 131	
55	56															81	82	83	84	85	86	
Cs caesium 133	Ba barium 137															Tl thallium 204	Pb lead 207	Bi bismuth 209	Po polonium -	At astatine -	Rn radon -	
87	88																114		116			
Fr francium -	Ra radium -																Flerovium Fl		Livermorium Lv			
lanthanoids																						
57	58	59	60	61	62	63	64	65	66	67	68	69	70	71								
La lanthanum 139	Ce cerium 140	Pr praseodymium 141	Nd neodymium 144	Pm promethium -	Sm samarium 150	Eu europium 152	Gd gadolinium 157	Tb terbium 159	Dy dysprosium 163	Ho holmium 165	Er erbium 167	Tm thulium 169	Yb ytterbium 173	Lu lutetium 175								
89	90	91	92	93	94	95	96	97	98	99	100	101	102	103								
Ac actinium -	Th thorium 232	Pa protactinium 231	U uranium 238	Np neptunium -	Pu plutonium -	Am americium -	Cm curium -	Bk berkelium -	Cf californium -	Es einsteinium -	Fm fermium -	Md mendelevium -	No nobelium -	Lr lawrencium -								

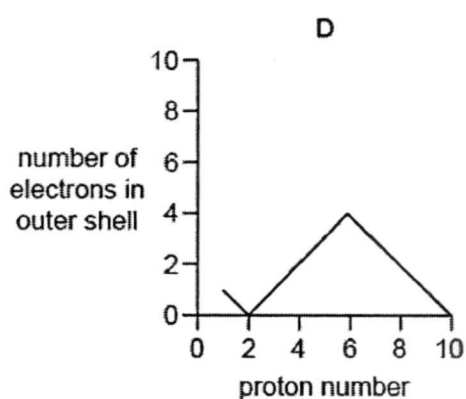
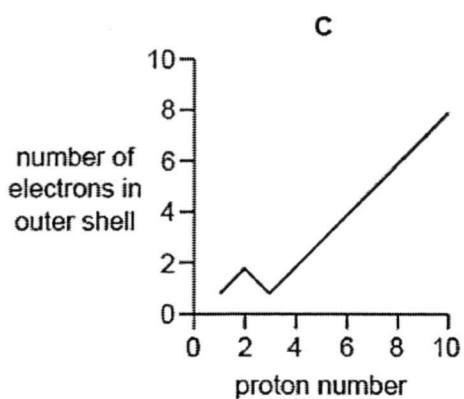
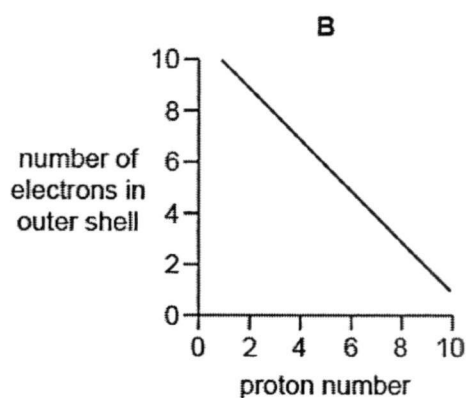
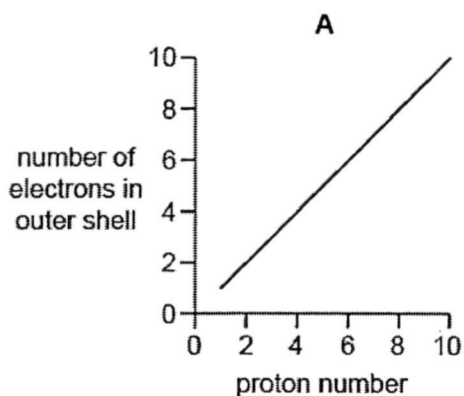
The volume of one mole of any gas is 24 dm^3 at room temperature and pressure (r.t.p.)

Section AAnswer **all** questions in this section.

Record your answer in the answer table provided.

Question	1	2	3	4	5	6	7	8	9	10
Answer	C	C	D	B	A	D	A	B	B	B

- 1 Which graph shows the number of electrons in the valence shell of an atom, plotted against the proton number of the first ten elements in the Periodic Table?(Chap 8, C)



- 2 In which one of the following sets do all three particles have the same number of electrons?(Chap 8, C)

A	Cl^-	Br^-	I^-
B	F^-	Mg^{2+}	Be^{2+}
C	K^+	Ca^{2+}	Cl^-
D	Na^+	Al^{3+}	Ar

- 3 If calcium atom and Cl-35 isotope are used to produce the compound calcium chloride, calculate the number of neutrons in this compound. (**Chap 8, D**)

A 37 **B** 38 **C** 54 **D** 56

- 4 Which statement(s) is/are true about the elements in Group 0? (**Chap 8, B**)

- I. All the Group 0 elements cannot combine with other elements to form compounds.
- II. All the Group 0 elements are non-metals.
- III. All the Group 0 elements have 8 electrons in the valence shell.

A I only

B I and II only

C I, II and III

D None of the above

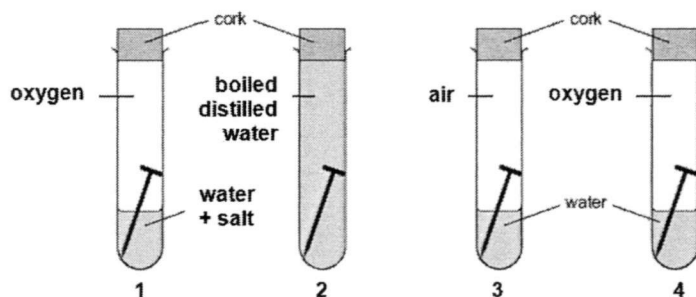
- 5 When substances are mixed, a chemical change may take place. Which of the following does not result in a chemical change? (**Chap 18, A**)

- A** Adding a strip of copper to vinegar.
- B** Adding baking powder to hydrochloric acid.
- C** Adding calcium carbonate powder to nitric acid.
- D** Adding sulfuric acid to aqueous ammonia.

- 6 A student heated some substances in air and recorded the results in the table below. Which substance has undergone a physical change? (**Chap 18, D**)

	observations		
	before heating	during heating	after heating
A	green solid	brown solid	brown solid
B	reddish-brown solid	reddish-brown solid	black solid
C	silvery grey solid	bright glow emitted	white solid
D	silvery grey solid	silvery grey liquid	silvery grey solid

- 7 An experiment was set up as shown below to investigate the rate of rusting under different conditions.



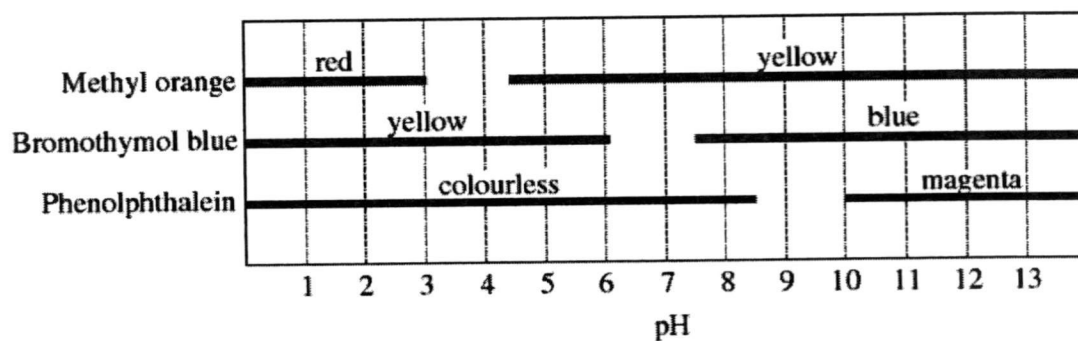
Predict the order of the test-tubes in which rust would first appear. (Chap 18, A)

- A 1, 4, 3, 2
 B 1, 3, 4, 2
 C 2, 3, 4, 1
 D 3, 4, 1, 2
- 8 A solution has a pH of 14. Which ion must be present in the solution?(Chap 18, B)
- A hydrogen ion
 B hydroxide ion
 C oxide ion
 D sodium ion
- 9 Solution A gives a dark blue colour with Universal Indicator. When 10 drops of solution W are added to solution A, the colour remains the same. When 10 drops of solution P are added to solution A, the colour turns yellow. When 20 drops of solution P are added to solution A, the colour turns red. Which one of the following shows the possible identities of solutions A, W and P? (Chap 18, B)

	solution A	solution W	solution P
A	acid	alkali	alkali
B	alkali	salt solution	acid
C	alkali	alkali	alkali
D	salt solution	water	acid

- 10 The diagram below shows the colour ranges of three different pH indicators, methyl

orange, bromothymol blue and phenolphthalein.



The pH of a solution is tested with these three pH indicators. The solution is yellow in methyl orange, yellow in bromothymol blue and colourless in phenolphthalein. What is the pH range of the solution? (**Chap 18, B**)

- A 2.0 to 3.0
- B 4.5 to 6.0
- C 7.5 to 8.5
- D 10.0 to 13.0

Section B

Answer **all** questions in this section.
Write your answers in the spaces provided.

- B1** Fig. B1.1 below shows the nuclei of five different atoms, A, B, C, D and E. The letters do not represent the chemical symbols of elements.

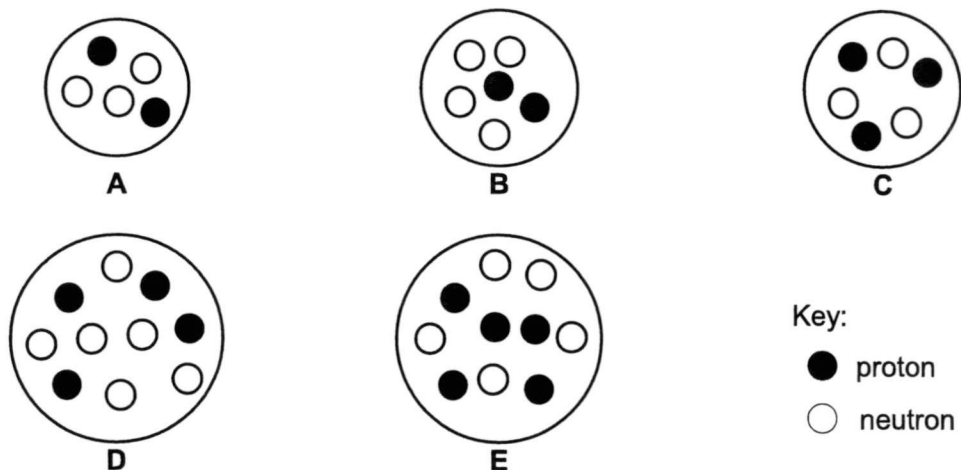


Fig. B1.1

Use the letters A, B, C, D and/or E to answer the following questions.

You may use the letters once, more than once or not at all.

- (a) Which two nuclei belong to atoms which are isotopes? Explain your answer.

A and B. [1] Both A and B have 2 protons each, but A has 3 neutrons while B has 4 neutrons. [1] / Both A and B have the same number of protons but different number of neutrons.

- (b) Which nucleus is/are in atoms belonging to Group II of the Periodic Table? Explain your answer.

D. [1] It has 4 protons, thus 4 electrons. Having 2 valence electrons, it is in Group II of the Periodic Table. [1]

If a list of answers are given, only award the first mark if D is the first answer.

- B2** A green solid, copper(II) carbonate, was heated strongly as shown in **Fig.B2.1**. A black solid was formed in the boiling tube and a colourless, odourless gas was given off.

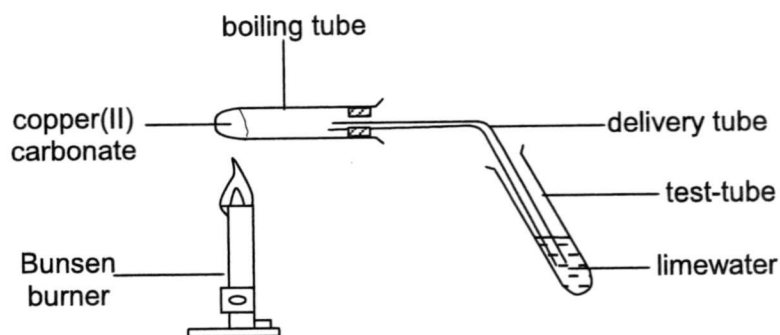


Fig.B2.1

The mass of the boiling tube and its contents are recorded in **Fig.B2.2** below.

Apparatus with/without contents	Mass (g)
Boiling tube	50.0
Boiling tube and contents before heating	62.4
Boiling tube and contents after heating	58.0

Fig.B2.2

- (a) Name the type of reaction taking place.

Thermal decomposition [1]

- (b) Write down the word and chemical equations for the reaction.

Word equation:

copper(II) carbonate → copper(II) oxide + carbon dioxide gas [1]

Chemical equation:

$\text{CuCO}_3 \rightarrow \text{CuO} + \text{CO}_2$ [1]

- (c) Explain, with evidence, why this is a chemical reaction and not a physical change.

New products (copper(II) oxide and carbon dioxide gas) are formed. [1]

There is a drop in mass of the contents after heating. [1]

- (d) State what will be observed in the limewater during the experiment.

A white precipitate will be formed in the limewater.

Note: ecf from (b) is allowed

Section C

Answer **at least** one question.

Write your answers in the lined pages provided.

Answer a total of four questions from Section C, one from each booklet. The fourth question can be chosen from any of the booklets.

C1 (a) Potassium combines with sulfur to form potassium sulfide.

(i) State the chemical formulae of potassium and sulfide ions. [1]

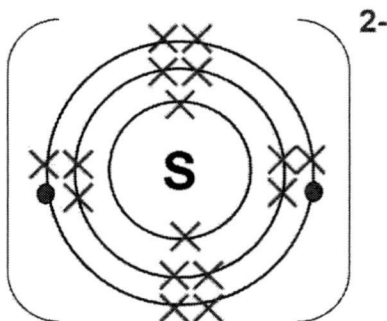
Potassium ion - K^+

Sulfide ion - S^{2-}

Both must be correct to obtain one mark

(ii) Draw the electronic structure of a sulfide ion. [2]

Sulfide ion (S^{2-})



[1] – correct number of electrons, showing the 2 different symbols for electrons

[1] – brackets and correct charge indicated

(b) **Fig. C1.1** shows a box of antacid tablets that is commonly used to treat gastric pain. Gastric pain is a condition whereby there is an over-production of hydrochloric acid in the stomach and the tablets are used to reduce the acidity.

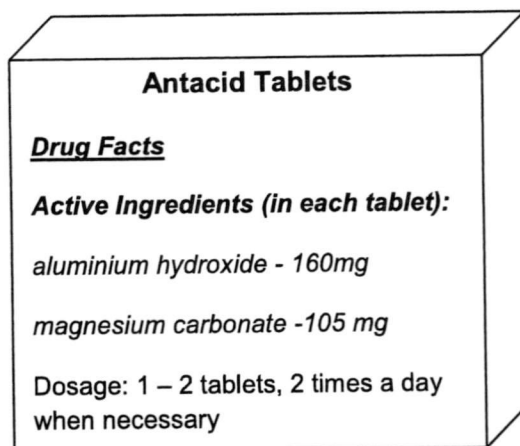
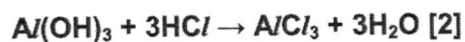


Fig. C1.1

Explain how one of the ingredients in antacid tablets helps to reduce the acidity in the stomach. Write a chemical equation to support your answer. [3]

Aluminium hydroxide reacts with hydrochloric acid to form aluminium chloride and water. [1] / Aluminium hydroxide is an alkali that neutralises the acid. [1]

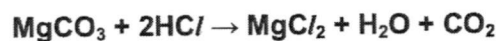


[1] – correct chemical formulae

[1] – correct balancing

OR

Magnesium carbonate reacts with hydrochloric acid to form magnesium chloride, water and carbon dioxide gas. [1]



[1] – correct chemical formulae

[1] – correct balancing

- (c) Leon carried out an investigation to identify substance X, which is either calcium metal or calcium carbonate. Fig. C1.2 shows the test he carried out and his observations.

Test	Observation	Conclusion
------	-------------	------------

Place a spatula of substance X into a test-tube and add 5 cm ³ of hydrochloric acid.	Effervescence was observed. Substance X disappeared.	X is calcium metal.
---	--	---------------------

Fig.C1.2

Do you agree with Leon's conclusion? Support your answer with explanation, and if necessary, suggest a modification to the experiment. [4]

Leon cannot conclude that X is calcium as both calcium and calcium carbonate react with hydrochloric acid and produce a gas. [1] Leon can insert a lighted splint into the mouth of the test tube. [1] If the lighted splint extinguishes with a 'pop' sound, hydrogen gas is present. [1] Then, X would be calcium as calcium reacts with hydrochloric acid to produce hydrogen gas. [1]

- C2 (a)** Upon strong heating, lead(II) nitrate breaks down into lead(II) oxide, nitrogen dioxide gas and oxygen gas.

- (i) Construct a balanced chemical equation for the above reaction. [2]



[1] – correct chemical formulae

[1] – correct balancing

- (ii) Why is nitrogen dioxide harmful to the environment? [1]

Nitrogen dioxide dissolves in rainwater to form acid rain, which corrodes limestone buildings / destroys vegetation / kills aquatic life.

- (b)** Antimony oxide has the chemical formula Sb_2O_3 while potassium phosphate has the chemical formula K_3PO_4 .

Using the information, deduce the chemical formulae of antimony ion and phosphate ion, and the chemical formula of antimony phosphate. [2]

Antimony ion – Sb^{3+} [1/2]

Phosphate ion – PO_4^{3-} [1/2]

Antimony phosphate – SbPO_4 [1]

- (c) **Fig. C2.1** shows an experimental setup to study the pH changes as hydrochloric acid is slowly added to 25.0 cm^3 of sodium hydroxide. It is observed that the colour in the flask changes from violet to green, then to red.

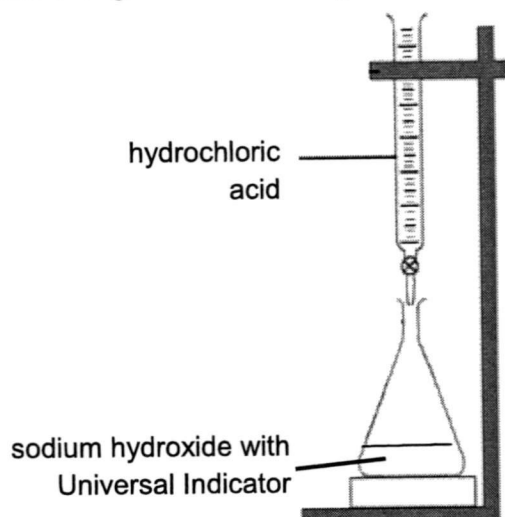


Fig.C2.1

- (i) With reference to substances present in the conical flask, explain the colour changes observed.[3]

The colour is violet at the start as only sodium hydroxide, a strong alkali, is present in the conical flask. [1]

The colour changes to green when neutralisation is complete. [1/2]
Sodium chloride and water are present in the conical flask. [1/2]

The colour changes to red when hydrochloric acid is added in excess. [1/2]
Sodium chloride, water and hydrochloric acid (a strong acid) are present in the conical flask. [1/2]

- (ii) Explain what colour change(s) would be observed if the experiment is repeated, replacing sodium hydroxide with sodium nitrate.[2]

The colour would change from green to red.

The colour is green because sodium nitrate is neutral. [1] It would change to red when hydrochloric acid is added. [1]

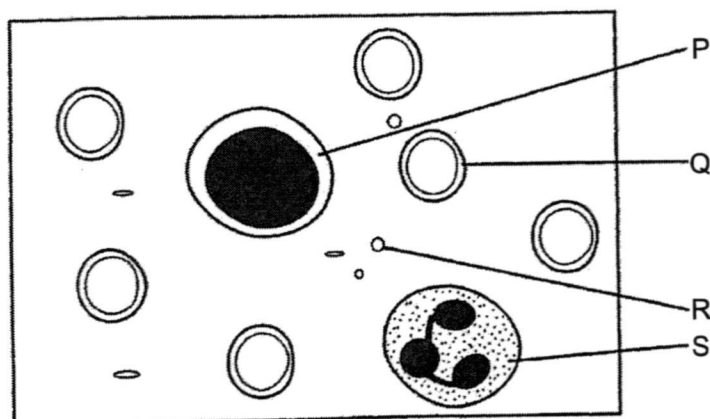
End of Paper

Section A

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 answer in the corresponding box below.

Question	1	2	3	4	5	6	7	8	9	10
Answer										

- 1 Which of the following statements about diffusion is **not** true?
- A** It is a type of passive transport as no source of energy is needed in order for this process to occur.
- B** This process can only take place in the presence of a partially permeable membrane.
- C** Water vapour leaving the stomata of the leaves is an example of diffusion.
- D** When the concentration in two separate regions are the same, there will be no net movement of molecules.
- 2 Johan viewed a blood slide under a microscope and this is what he saw.



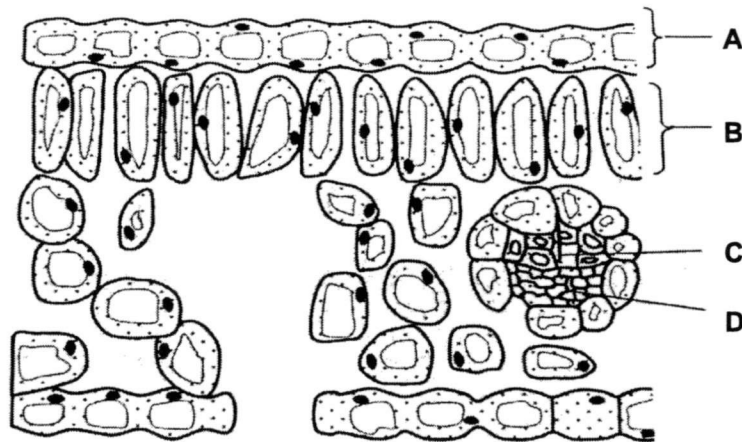
Which cells help to destroy harmful micro-organisms?

- A** P and S
- B** P and Q
- C** Q and S
- D** Q and R

- 3 Which enzyme will digest soy bean and what are the products?

	enzyme	products
A	protease	fatty acids and glycerol
B	lipase	amino acids
C	protease	amino acids
D	lipase	fatty acids and glycerol

- 4 The diagram below shows cells in part of a leaf. Which one of the following is responsible for the transport of water?



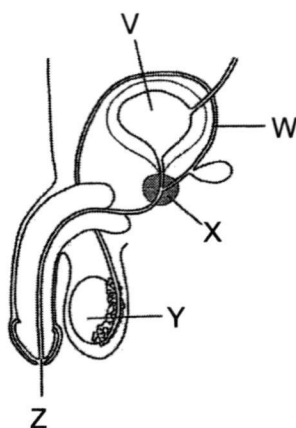
- 5 Which of the following statements about puberty is true?
- I The deepening of voice is due to the enlargement of the voice box.
 - II Oestrogen causes the onset of puberty in boys.
 - III The production of sperms begins after puberty.
 - IV An person becomes sexually immature upon the onset of puberty.
 - V All females have a small amount of testosterone in their body.

- | | |
|------------------|-------------------|
| A I & III | B III & IV |
| C II & V | D I & IV |

6 Which of the following statements is **not** true of asexual reproduction.

- A Only one parent is needed for reproduction to occur.
- B It occurs only in unicellular organisms.
- C Genes are passed down from parent to child.
- D The offspring looks similar to the parent.

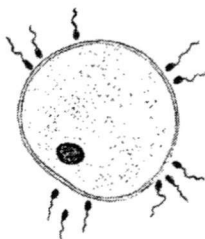
7 The diagram shows the male reproductive system.



Which parts are responsible for the production of sperms and seminal fluid?

	sperms	seminal fluid
A	V	Z
B	Y	X
C	W	V
D	X	Y

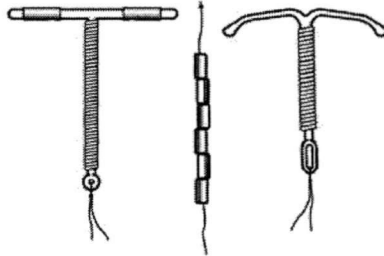
8 The diagram below shows two types of gametes found in humans.



What is immediately formed by the fusion of the two gametes?

- A zygote
- B embryo
- C fetus
- D ovum

- 9 The diagram shows a type of contraception.



Which of the following statements best explains how it works?

- A It is inserted into the cervix and prevents the sperm from fertilising the ovum.
 - B It is inserted into the uterus and prevents the implantation of a fertilised ovum.
 - C It blocks the cervix and prevents the entry of sperms into the oviduct.
 - D It blocks the uterus and prevents the ovum from developing into a fetus.
- 10 Which of the following statements is true about Gonorrhea?
- I It is caused by a virus.
 - II It can be cured with antibiotics if detected early.
 - III It may cause blindness in new-born babies.
 - IV It can be spread by kissing an infected person.
 - V It may result in the damage of reproductive organs.
- A I, II and III
 - B II, III and IV
 - C II, III and V
 - D I, IV and V

Section B

Answer **all** questions in this section.

Write your answer in the spaces provided.

B1 Fig 1.1 shows a section through a human heart and the direction of the flow of blood.

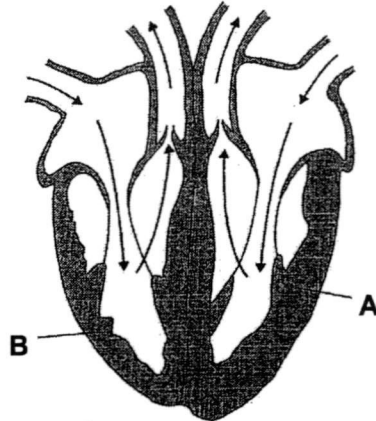


Fig 1.1

- (a) Complete the sentences below with a suitable word. [2]

In a single heartbeat, the contract simultaneously, followed by the contraction of the which pump blood through the to the lungs and through the to the rest of the body. During this contraction, the heart valves close to prevent the backflow of blood.

- (b) Explain why **A** is more muscular than **B**.

.....
 [1]

B2(a) Why is abortion not considered a method of contraception?

.....

 [2]

B2(b) Give an example of a scenario when induced abortion, under medical supervision, is deemed socially acceptable.

.....
 [1]

B3 Fig 3.1 shows an experiment conducted by James involving substances **X** and **Y**.

The three beakers contain distilled water. After a period of time, the distilled water and visking tubing are tested for the presence of food substances **X** and **Y**.

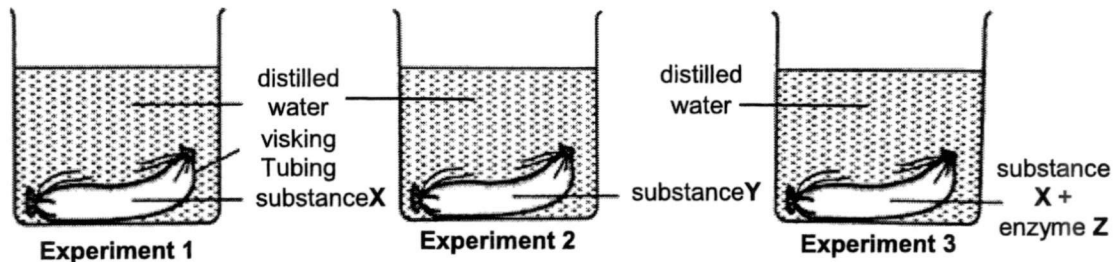


Fig 3.1

Experiment Results for	1		2		3	
	visking tubing	distilled water	visking tubing	distilled water	visking tubing	distilled water
Benedict's Test	negative	negative	positive	positive	positive	positive
Iodine's Test	positive	negative	negative	negative	positive	negative

The results are shown in **Table 3.1**.

(a) Predict what substances **X** and **Y** could be. Explain your answer.

.....

Table 3.1
 [2]

- (b) (i) Explain the test results in experiment 3.
 (ii) Write a suitable word equation to support your explanations for the reaction occurring in that experiment.

.....

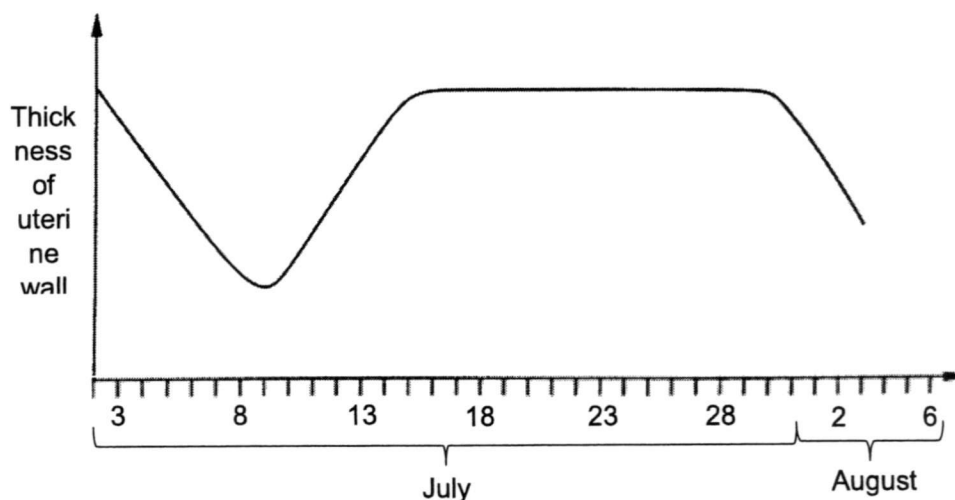
[2]

Section C

Answer at least **one** question on the lined pages provided.

Answer a total of **four** questions from **Section C**, at least one from each booklet. The fourth question can be chosen from any of the booklets.

C1 The graph below shows the changes in the thickness of the uterine wall in a woman's body from 3 July to 6 August.



- (a) (i) Define menstruation. [1]
 (ii) State the dates when menstruation occurred in July. [1]
- (b) Explain the significance in the increase of the thickness of the uterine wall from 9 to 15 July. [1]
- (c) (i) If the woman wants to have a baby, determine the period when she is fertile. [1]
 (ii) Assuming fertilisation occurred during her fertile period, describe the process of fertilisation, starting from the fertile period until the fertilised egg reaches the uterine wall. [6]

C2 AIDS is considered one of the deadliest Sexually Transmitted Infection.

- | | | |
|------------|--|------------|
| (a) | Explain the above statement. | [3] |
| (b) | (i) Give the full name of AIDS and the agent that causes AIDS. | [1] |
| | (ii) Suggest two reasons how this agent spreads so quickly. | [2] |
| | (iii) Suggest two preventive measures to prevent its spread. | [2] |
| (c) | Explain why the treatment for syphilis cannot be used for the treatment of AIDS. | [2] |

[illegible]

END OF BOOKLET

Answers

Question	1	2	3	4	5	6	7	8	9	10
Answer	B	A	C	C	A	D	B	A	B	C

B1a) atria [A0.5] ventricles [A0.5] pulmonary artery [A0.5] aorta [A0.5]

B1b) A is more muscular than B as it has to **pump oxygenated blood over a large distance** [A1] around the body.

B2a) Abortion is the **deliberate ending of a pregnancy**[A1], in which the egg has already been fertilised. It is **not a method to stop fertilisation**, [A1] hence is not considered to be a form of contraception

B2b) When the mother's life is at risk/ the baby is unable to survive. [A1]

B3a) X: Starch [A0.5] Tested positive for iodine test which tests for presence of starch [A0.5]

Y: Maltose [A0.5] Tested positive for benedict's tests which tests for presence of reducing sugars. [A0.5] (x Do not accept Glucose)

B3b) Starch (amylase)→ Maltose.[A1] The visking tubing acts as a **partially permeable membrane**. [A0.5] The starch molecules are too **large to pass through the pores** of the visking tubing [A0.5] but after being broken down to maltose by enzyme amylase, maltose is **small enough to pass through the pores** of the viskingtubing[A0.5].

Any 2 points

C1ai) Menstruation is the **monthly discharge of the uterine lining** together with **blood** and the **unfertilised egg** from the uterus via the vagina. [A1]

C1aii) From 3 to 8 July [A1]

C1b) **To repair and thicken the uterine wall** to prepare the woman for the **possible implantation** of a fertilised egg. [A1]

C1ci) From 13 July to 19 July

C1cii) **Ovulation** takes place during the fertile period when a mature egg is released into the fallopian tube. [A1] During sexual intercourse, **semen containing sperms are deposited** in the vagina of the woman [A1] The sperms swim towards the direction of the mature egg and **one sperm will fertilise the egg successfully**. [A1] The **zygote will move down** towards the uterus [A1] and starts to **divide into a ball of cell called the embryo** during its journey. [A1] Once reaching the uterus, it **implants itself into the uterine lining**, known as implantation. [A1]

C2a) AIDS is the deadliest STI as there is **no cure** to date [A1] AIDS **incubates itself** in the infected person's body for a **long period** of time without harming the person in a noticeable

manner/ the **person appears healthy** [A1] However, the **last stages are very severe** as the person dies of Kaposi's Sarcoma or brain damage [A1]

C2bi) Acquired Immunodeficiency Syndrome [A0.5]; Human Immunodeficiency Virus [A0.5]
(wrong spelling, no mark)

C2bii) It is spread by the transfer of bodily fluid such as semen and blood [A1] by having unprotected sex [A1] It is transmitted by sharing of needles with an infected person [A1] (**Accept any other valid answers, up to 2 marks**)

It can be prevented by educating others about HIV and how it is spread [A1], keeping to one sexual partner/ avoiding promiscuous behaviour [A1], using a condom during sexual intercourse [A1] and avoiding of drug abuse/ sharing of hypodermic needles among drug addicts [A1]. Ensure needles for sterilised in a tattoo/ piercing establishment [A1] (**Accept any other possible answers, up to 2 marks**)

C2c) Syphilis is caused by a **bacteria** but AIDS is caused by a **virus**. [A1] Antibiotics can **kill/ destroy/ target bacteria** but not viruses [A1] Viruses attack the immune system, therefore viruses will not work [A1]. (**Accept any 2 points**)