NEW TOWN SECONDARY SCHOOL
Mid-Year Examination
Secondary 1 Express

NAME

CLASS

INDEX NUMBER

Lower Sec Science
Part 2 (Biology)

8 May 2017
0900-1030
1 hour 30 minutes
(For Parts 1 and 2)

READ THESE INSTRUCTIONS FIRST

Write your name, register number and class in the spaces provided above.
Write in dark blue or black pen.
DO NOT use staples, highlighters, glue or correction fluid/tape.

Answer **both** Part 1 and Part 2.

Section A (10 marks)
Each question consists of four possible answers. Select the **most** appropriate answer and record its alphabet in the space provided on page 6.
Each correct answer will be awarded 1 mark. No marks will be deducted for incorrect answers.

Section B (30 marks)
Answer all questions in the spaces provided.

The use of an approved scientific calculator is expected, where appropriate.

For Examiner's Use	
Section A	
Section B	
Total for Part 2	

This document consists of 1

Setter: Mdm S.Valli

Section A (10 marks)

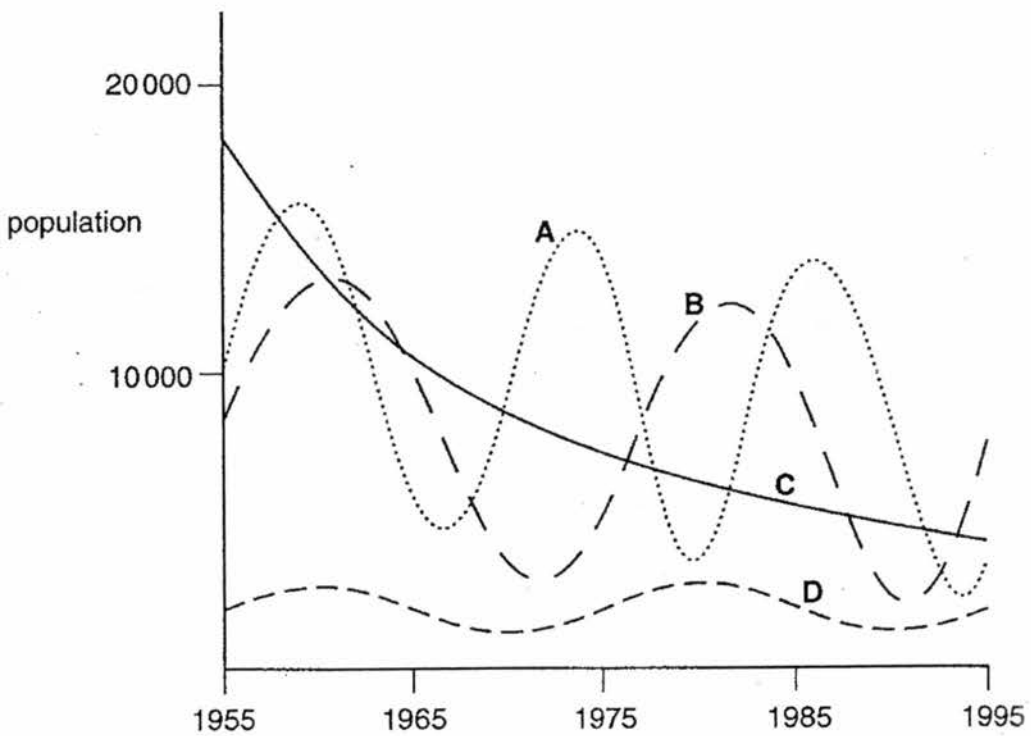
Select the **most** appropriate answer and record its alphabet in the space provided on page 6.

1 Which of the following represents an adaptation of a mangrove plant to oxygen-deficient soil?

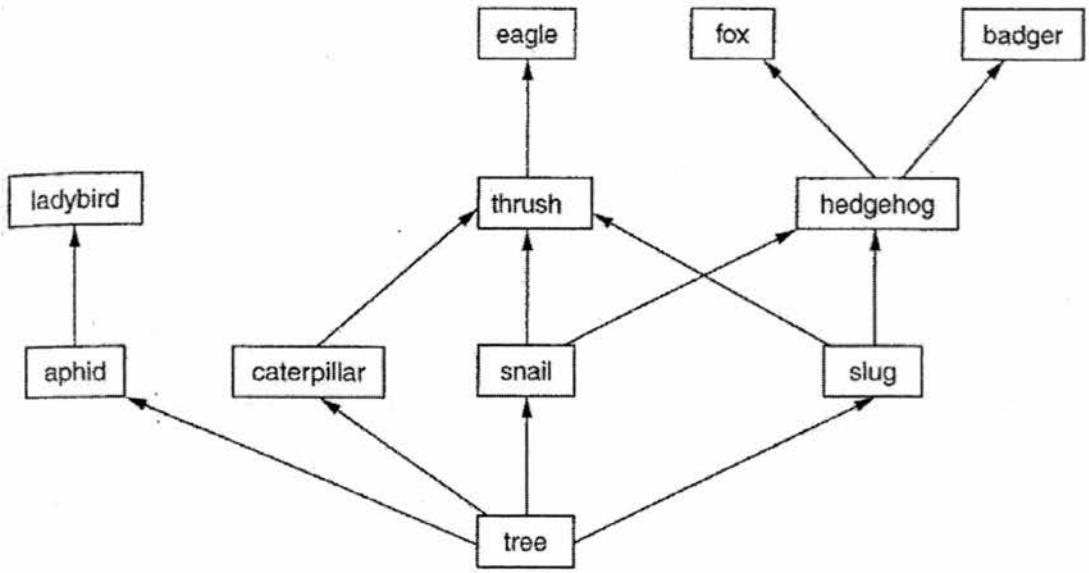
A They photosynthesise at low tide.
B They secrete salt through the leaves.
C They have needle like leaves.
D They have aerial roots that stick out of the soil.

2 The population sizes of four different species of insect were monitored over a period of 40 years. The results are shown on the graph below.

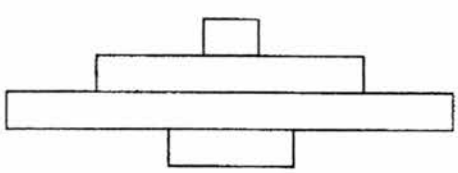
Which species is in the greatest danger of extinction?



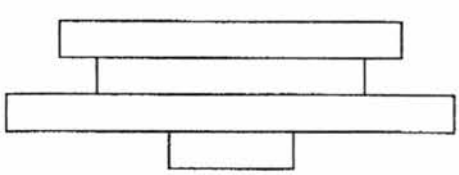
3 The diagram shows part of a food web.



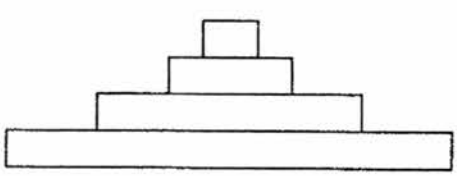
Which is a pyramid of energy based on this food web?



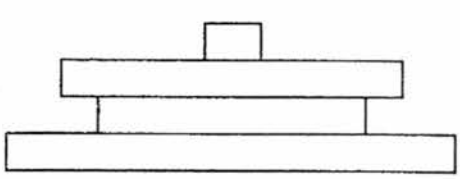
A



B



C



D

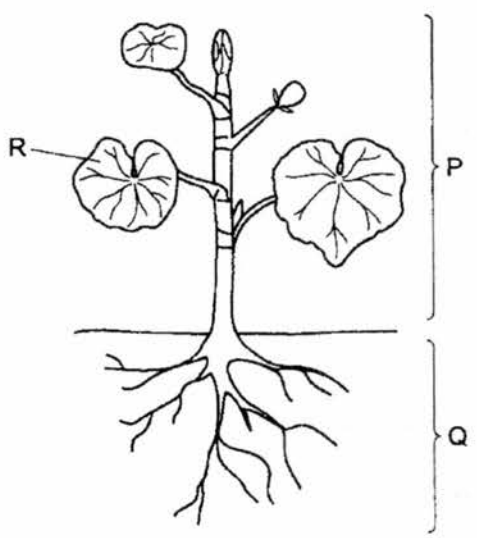
4 Humans affect the environment in the following ways.

1. felling of the tropical forest
2. harvesting of marine algae
3. reforestation
4. combustion of fuel
5. overuse of nitrate fertilizer

Which human activities lead to an increase in the level of carbon dioxide in the Earth's atmosphere?

A 1, 2 and 3
B 1, 2 and 4
C 2, 3 and 4
D 2, 3 and 5

5 The diagram shows a flowering plant



Which correctly identifies P, Q and R?

	P	Q	R
A	organ	organ	tissue
B	organ	organ system	organ
C	organ system	organ	tissue
D	organ system	organ system	organ

6 Which of the following represents the overall magnification of a microscope that has an eyepiece magnification of 10X and an objective magnification of 40X?

A 10X
B 40X
C 400X
D 1000X

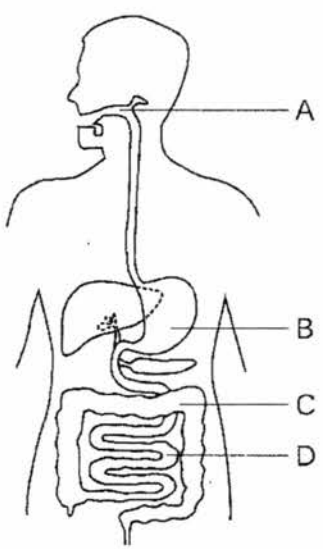
7 Which of the following is **true** for both xylem vessel and red blood cells?

A large surface area to volume ratio
B no nucleus
C no cytoplasm
D thickened cell wall

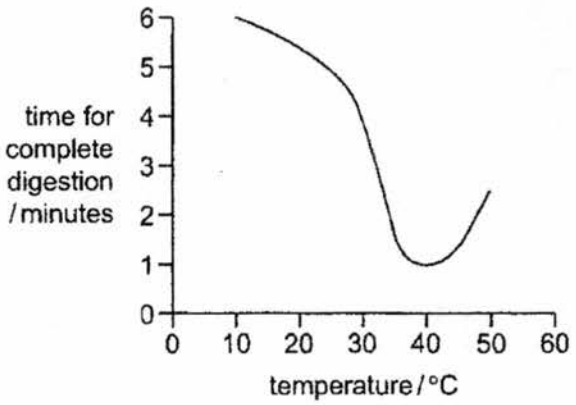
8 Which chemical element forms part of **all** protein molecules?

A calcium
B iron
C magnesium
D nitrogen

9 The diagram shows the human alimentary canal. In which part do simpler food substances enter the blood stream?



10 The graph shows the effect of temperature on the time taken for the complete digestion of starch.



At which temperature is the rate of digestion of starch the greatest?

A 10 °C
B 30 °C
C 40 °C
D 50 °C

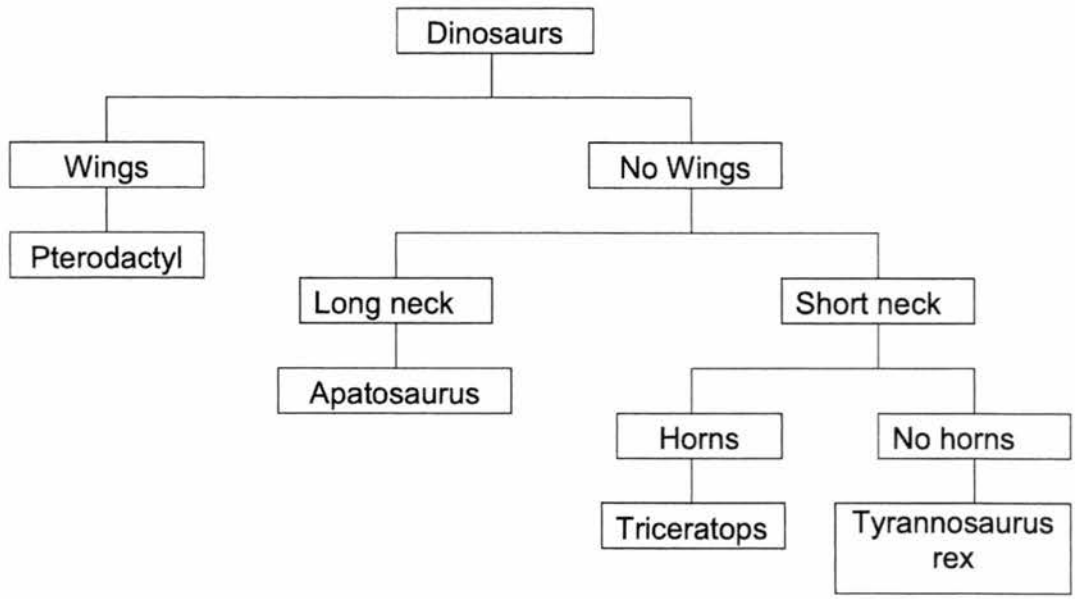
Answers for Section A

1	2	3	4	5	6	7	8	9	10

Section B (30 marks)

Answer all questions in the spaces provided.

11 Identify the different types of dinosaurs shown by using the dichotomous key given in Fig. 11.1. [4]



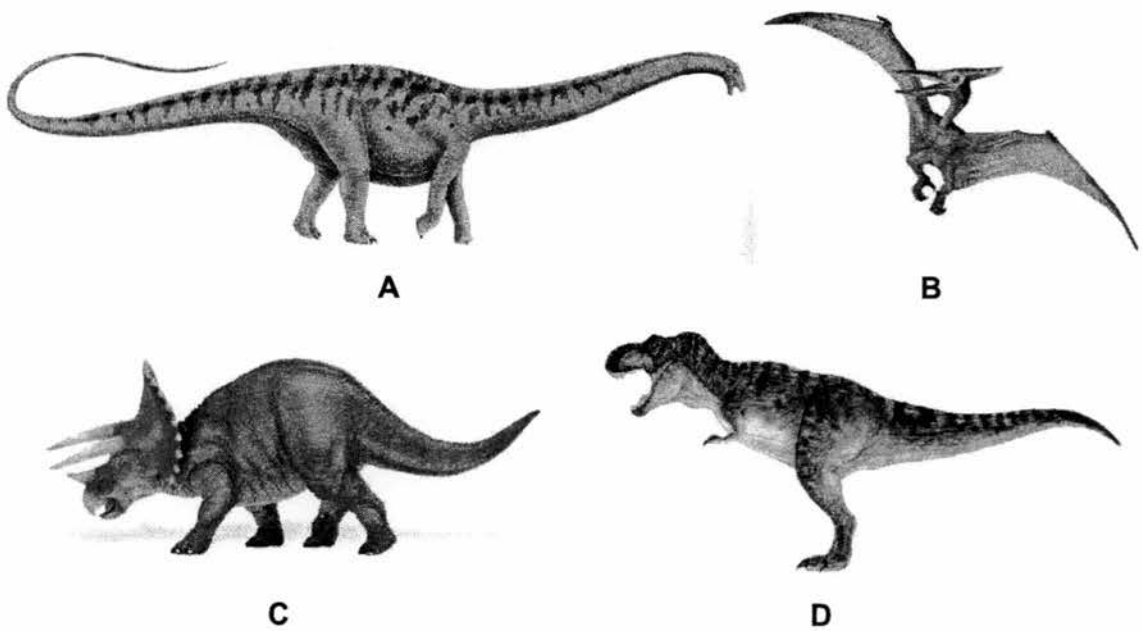


Fig. 11.1

A is ..... **B** is .....

C is ..... **D** is .....

12 Fig. 12.1 shows the energy flow in kilojoules (kJ) through a food chain.

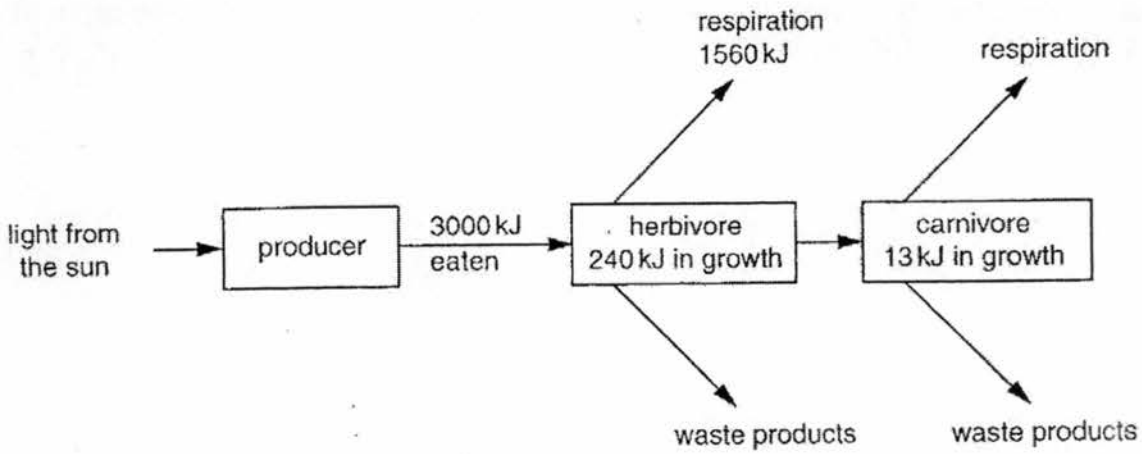


Fig. 8.1

(a) (i) How much energy is lost from the food chain as waste products from the herbivores? [1]

.....

(ii) Calculate the percentage of the energy taken in by the herbivore that is used in growth. [1]

(b) State the importance of chloroplasts in the food chain. [2]

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.....

(c) Suggest why this food chain could not have another trophic level. [2]

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13 Fig. 13.1 shows some muscle cells.

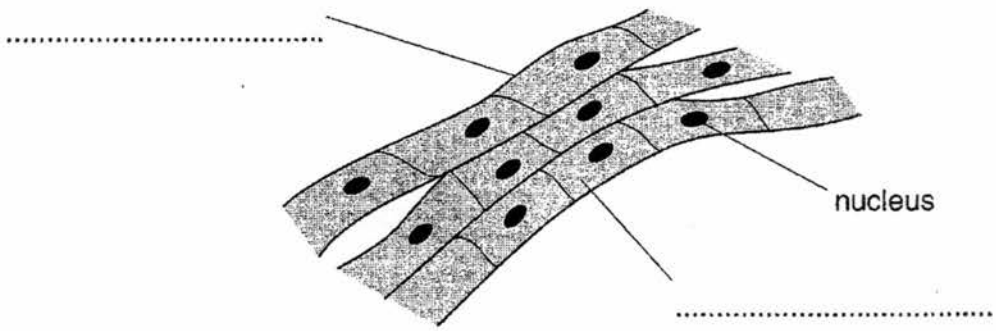

Fig. 13.1

(a) Complete the labels in Fig. 13.1. [2]

(b) Describe **two** ways Fig. 13.1 shows that these are animal cells and not plant cells. [2]

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(c) What does a group of muscle cells form? [1]

.....

14 Some cells are specialised to carry out specific functions.

Fig. 14.1 shows a specialised plant cell.

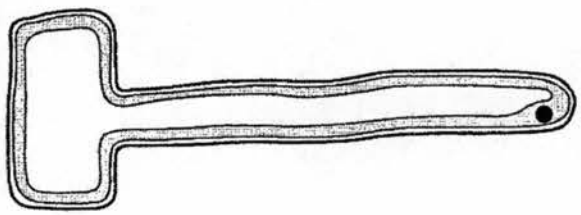

Fig. 14.1

(a) Name the cell shown in Fig. 14.1. [1]

.....

(b) What is the function of the cell shown in Fig. 14.1? [1]

.....

(c) Explain how the structure of cell shown in Fig. 14.1 is related to its function. [2]

.....

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15 Fig. 15.1 shows part of the alimentary canal.

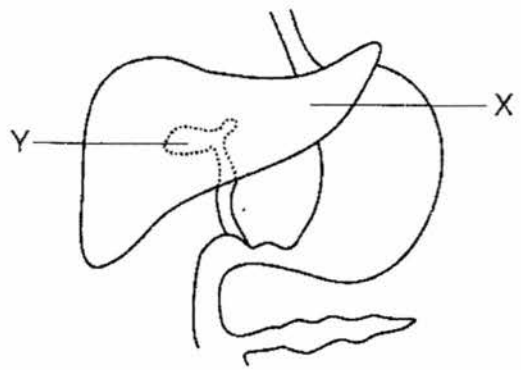

Fig. 15.1

(a) Name organs X and Y. [2]

X .....

Y .....

(b) Describe briefly how organs X and Y increase the efficiency of digestion in the human alimentary canal. [3]

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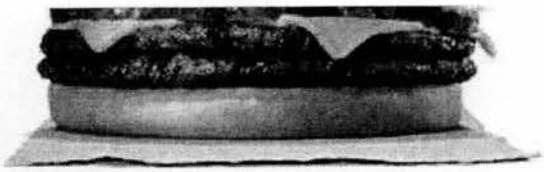
16  for lunch.

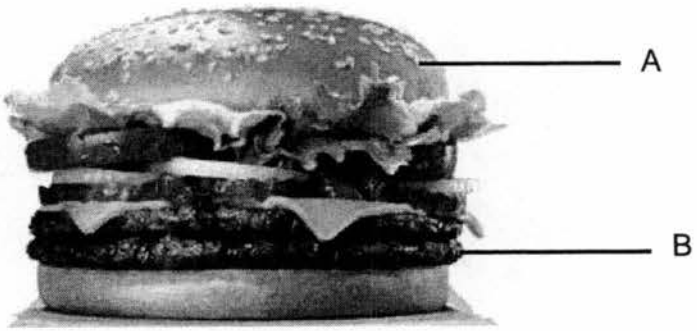


Fig. 16.1

(a) Complete the table below to show the name and nutrient content of the food components of the burger shown in Fig. 16.1. [2]

food component of the burger	put a tick to show the main type of nutrient(s) present
A	☐ carbohydrates ☐ proteins ☐ fats
B	☐ carbohydrates ☐ proteins ☐ fats

(b) Describe how the food component A and B will be digested in the alimentary canal. [4]

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New Town Secondary School
1E Science(Biology) Mid-Year Exam 2017
Marking Scheme

Section A

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

Section B

Marks

11 A: Apatosauraus [1]
B: Pterodactyl [1]
C: Triceratops [1]
D: Tyrannasaurus [1]

12 (a)i 3000 – 1560 – 240 = 1200 kJ [1]
(working must be shown)

(a)ii 240/3000 x 100% = 8% [1]
(working must be shown)

(b) the presence of chloroplasts enable green plants to photosynthesise and produce their own food; [1]
other organisms feed on plants directly or indirectly and get their energy; [1]

(c) energy is lost at every trophic level and only a small amount / fraction of energy is passed on to the next trophic level; [1]
the amount of energy in the carnivore is too low to be passed on to another organism to sustain it; [1]

13 (a) Cell membrane; [1]
Cytoplasm: [1]

(b) Absence of cell wall; [1]
Absence of chloroplasts; [1]
Absence of large central vacuole; [1]
(any two points) Max=[2]

(c) muscle tissue [1]

14 (a) root hair cell [1]

(b) absorb water and mineral salts from the soil [1]

(c) elongated structure / long protrusion; [1]
Increase surface area to volume ratio to increase rate / efficiency of absorption;

15 (a) X: liver [1]
Y: gall bladder [1]

(b) liver produces bile; [1]
gall bladder stores bile; [1]
bile is released into small intestine to emulsify fats which increases the surface area of fats for digestion by enzymes / lipase; [1]

16 (a)

A: bread / bun	Carbohydrates	[1]
B: meat patty	Proteins	[1]

(b) carbohydrates partially digested in mouth by amylase into maltose; [1]
maltose is completely digested in the small intestine by maltase into glucose; [1]
proteins are partially digested in the stomach by protease into polypeptides; [1]
polypeptides are completely digested in the small intestine by protease into amino acids; [1]

NEW TOWN SECONDARY SCHOOL
Mid-Year Examination
Secondary 1 Express

NAME

CLASS

INDEX NUMBER

Lower Sec Science
Part 1 (Chemistry)

8 May 2017
0900-1030
1 hour 30 minutes
(For Parts 1 and 2)

READ THESE INSTRUCTIONS FIRST

Write your name, register number and class in the spaces provided above.
Write in dark blue or black pen.
DO NOT use staples, highlighters, glue or correction fluid/tape.

Answer **both** Part 1 and Part 2.

Section A (10 marks)
Each question consists of four options. Choose the best option for each question and write your answer in the **table provided on page 4**.
Each correct answer will be awarded 1 mark. No marks will be deducted for incorrect answers.

Section B (20 marks)
Answer all questions in the spaces provided.
The number of marks is given in [ ] at the end of each question or part question.

A copy of The Periodic Table is provided on page 9.

The use of an approved scientific calculator is expected, where appropriate.

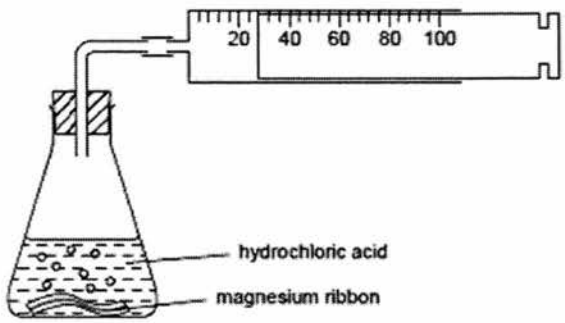
For Examiner's Use	
Section A	
Section B	
Total for Part 1	

This document consists of 9

Setter: Mr Mohamad Khirsyaban

Section A: Multiple Choice Questions (10 marks)

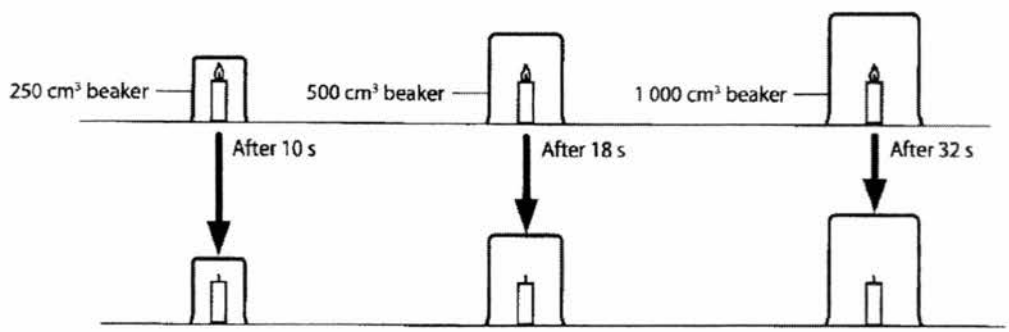
1 A magnesium ribbon is dropped into hydrochloric acid and the gas produced is collected as shown in the diagram below.



Which statement is **not** an observation made during the experiment?

A The magnesium ribbon became smaller.
B Hydrogen gas is produced.
C Bubbles are produced.
D 28 cm^3 of gas is produced.

2 Kelly performed an experiment as shown in the diagram below.



Which hypothesis could Kelly be testing?

A More oxygen leads to a candle burning longer.
B The bigger the candle, the longer it burns.
C A candle stops burning when all the oxygen has been used up.
D The bigger the beaker, the hotter the temperature of the flame.

3 Leonard saw a colourless chemical labelled with the symbol shown below.

What special precaution should he take to when using this chemical?

A He should heat the liquid before using it.
B He should wear safety goggles when heating the liquid.
C He should use a water bath to heat the liquid.
D He should wear gloves when handling the liquid.

4 Hip joint implants are inserted into patients who have damaged or fractured their hips. These implants, which used to be made of stainless steel, are now manufactured using titanium alloys.

The table below compares the properties of stainless steel and titanium alloys.

Properties	Stainless steel	Titanium alloy
strength	high	high
density	high	low
resistance to corrosion	high	high
thermal expansion	high	low
cost	low	high
magnetism	low	low

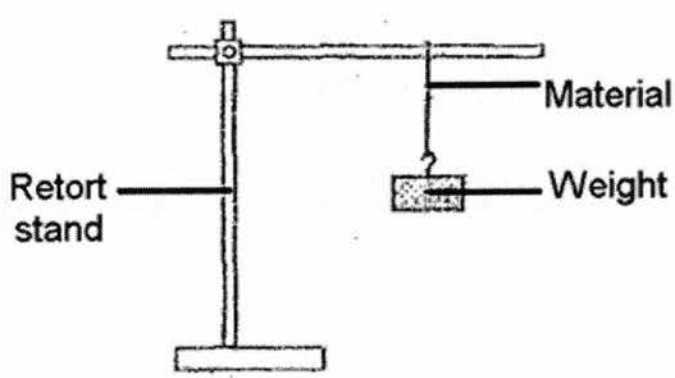
Based on the information, suggest why titanium alloys are used to make hip implants instead of stainless steel.

A The hip implants are heavier.
B The hip implants are more expensive to manufacture.
C The hip implants do not rust or corrode after a long time.
D The hip implants do not change lengths at different temperatures.

5 Which of these materials is correctly classified?

	Material	Classification
A	wood	ceramic
B	cotton	fibre
C	diamond	metal
D	steel	plastic

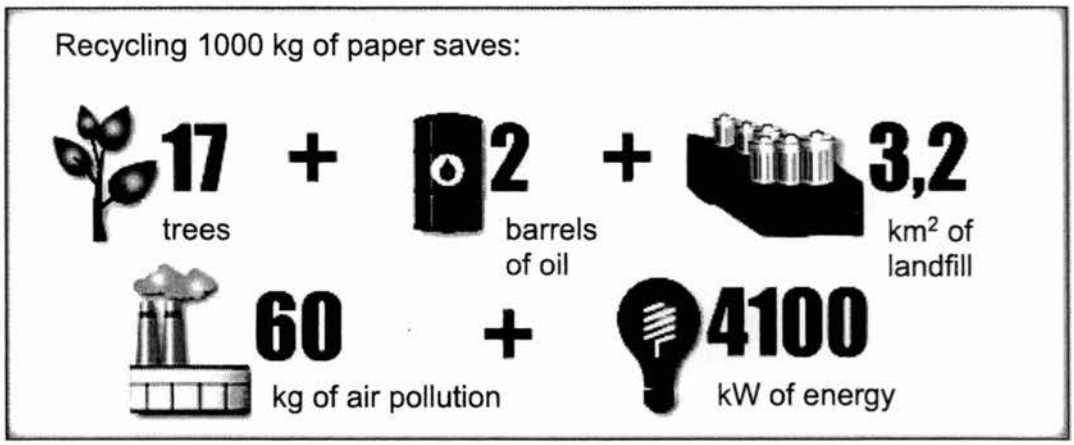
6 Tony set up the apparatus shown below to test the physical property of a material. He recorded the maximum weight he could attach to the material before it breaks.



Which physical property is he investigating?

A Strength
B Hardness
C Flexibility
D Malleability

7 The diagram below shows some information about recycling paper.



Based on the diagram above, which of the statements below is **not** true about recycling paper?

A Recycling paper results in fewer forests being cleared.
B Recycling paper reduces waste.
C Recycling paper protects the environment.
D Recycling paper uses up energy.

8 Which statement is true about compounds?

A They are colourless solutions.
B They can be separated by physical methods.
C They have fixed proportion of elements.
D They become a gas at 100 °C.

9 Which of the following is **not** true about a suspension?

A It is a mixture.
B It has the same colour throughout.
C It contains both solid and liquid particles.
D It is formed when substances cannot dissolve.

10 What is the chemical symbol for potassium?

A K
B Km
C P
D Po

Answers for Section A

Question	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Answer										

Section B: Structured Questions (20 marks)

11 The table below shows physical properties of some substances.

substance	appearance	electrical conductivity	melting point
A	shiny	good	high
B	dull	poor	low
C	transparent	poor	high
D	dull	only conducts when it is a liquid but not solid	high
E	shiny	good	low

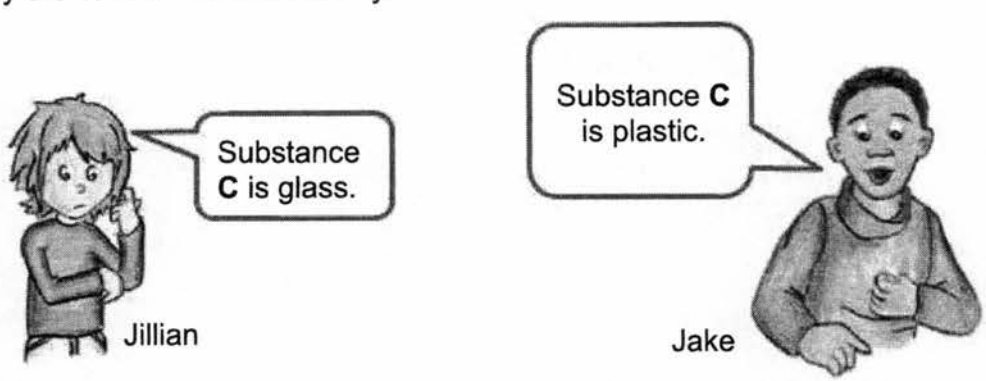
(a) Which substance in the table above should be used to make wires? Provide reasons for your answer.

.....

.....

..... [2]

(b) Study the cartoon below carefully.



Suggest a physical property that is missing from the table that might help Jake and Jillian with the identity of substance **C**. Describe how this property differs for glass and plastic.

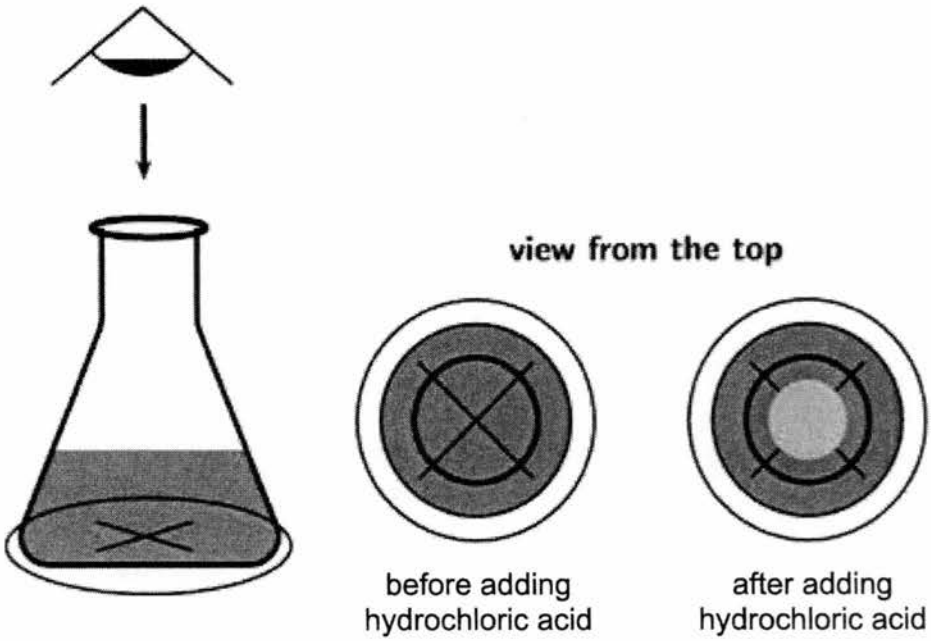
.....

.....

..... [2]

Total: [4 marks]

12 Steffi added 25 cm^3 of sodium thiosulfate solution into a conical flask, placed on top of a black cross, as shown below. She then added 10 cm^3 of hydrochloric acid into the conical flask and found that the cross could not be seen after some time.



(a) Draw and name the apparatus Steffi should use to measure the volume of sodium thiosulfate and hydrochloric acid.

Name of apparatus: ..... [2]

(b) Steffi wrote this observation in her book.

"After addition of hydrochloric acid, a suspension is formed."

Using information from the diagram, state whether her observation is correct. Explain your answer.

.....

.....

.....

(c) Steffi wants to investigate whether a higher temperature affects how fast the cross disappears.

i. State the independent and dependent variable of this investigation.

independent variable: .....

dependent variable: ..... [2]

ii. List two variables that she should keep constant for this experiment.

.....

..... [2]

iii. Should Steffi open or close the air-hole of the Bunsen burner when heating the conical flask? Explain your answer.

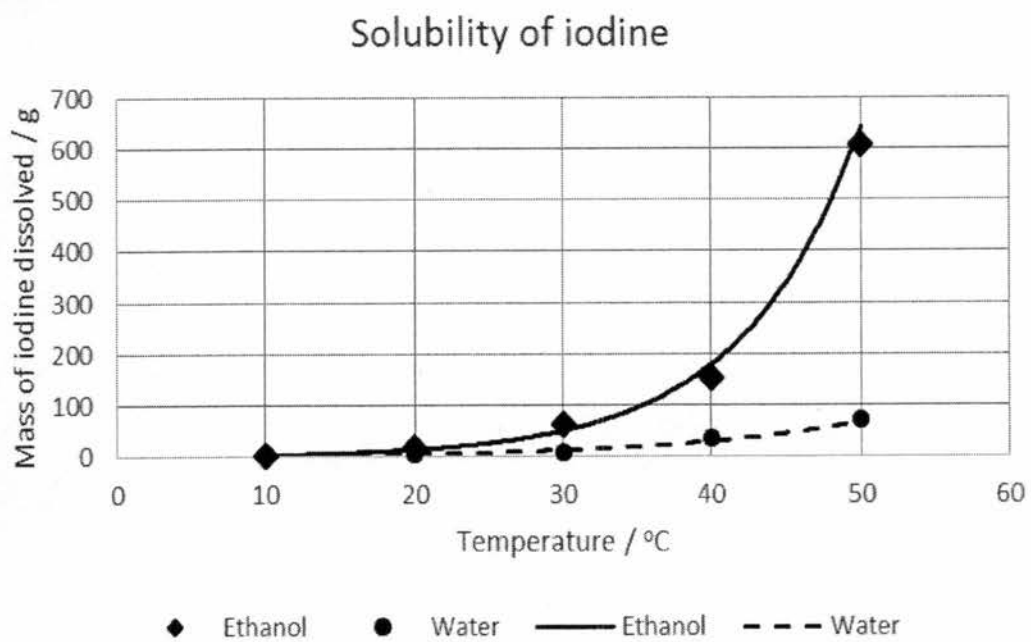
.....

.....

..... [2]

Total: [10 marks]

13 The graph below shows the mass of iodine that can dissolve in 1000 cm^3 of water and ethanol at different temperatures.



(a) What are the two factors affecting solubility shown in the graph above?

.....

..... [2]

(b) The solute in this experiment is an element.

i. Identify the solute in the experiment above.

..... [1]

ii. Explain what is meant by the term *element*.

.....

..... [1]

(c) Martina spilled some brown iodine solution onto her dress. She soaked her dress in hot water but is unable to remove the stain.

Using information from the graph, suggest what she can do to remove the iodine stain. Explain your answer.

.....

.....

.....

..... [2]

Total: [6 marks]

The Periodic Table of Elements

Group I	Group II											Group III	Group IV	Group V	Group VI	Group VII	Group 0
							1 H hydrogen 1										2 He helium 4
3 Li lithium 7	4 Be beryllium 9											5 B boron 11	6 C carbon 12	7 N nitrogen 14	8 O oxygen 16	9 F fluorine 19	10 Ne neon 20
11 Na sodium 23	12 Mg magnesium 24											13 Al aluminium 27	14 Si silicon 28	15 P phosphorus 31	16 S sulfur 32	17 Cl chlorine 35.5	18 Ar argon 40
19 K potassium 39	20 Ca calcium 40	21 Sc scandium 45	22 Ti titanium 48	23 V vanadium 51	24 Cr chromium 52	25 Mn manganese 55	26 Fe iron 56	27 Co cobalt 59	28 Ni nickel 59	29 Cu copper 64	30 Zn zinc 65	31 Ga gallium 70	32 Ge germanium 73	33 As arsenic 75	34 Se selenium 79	35 Br bromine 80	36 Kr krypton 84
37 Rb rubidium 85	38 Sr strontium 88	39 Y yttrium 89	40 Zr zirconium 91	41 Nb niobium 93	42 Mo molybdenum 96	43 Tc technetium -	44 Ru ruthenium 101	45 Rh rhodium 103	46 Pd palladium 106	47 Ag silver 108	48 Cd cadmium 112	49 In indium 115	50 Sn tin 119	51 Sb antimony 122	52 Te tellurium 128	53 I iodine 127	54 Xe xenon 131
55 Cs caesium 133	56 Ba barium 137	57 – 71 lanthanoids	72 Hf hafnium 178	73 Ta tantalum 181	74 W tungsten 184	75 Re rhenium 186	76 Os osmium 190	77 Ir iridium 192	78 Pt platinum 195	79 Au gold 197	80 Hg mercury 201	81 Tl thallium 204	82 Pb lead 207	83 Bi bismuth 209	84 Po polonium –	85 At astatine –	86 Rn radon –
87 Fr francium –	88 Ra radium –	89 – 103 actinoids	104 Rf Rutherfordium –	105 Db dubnium –	106 Sg seaborgium –	107 Bh bohrium –	108 Hs hassium –	109 Mt meitnerium –	110 Ds darmstadtium –	111 Rg roentgenium –	112 Cn copernicium –		114 Fl flerovium –		116 Lv livermorium –		

Key

proton (atomic) number
atomic symbol
name
relative atomic mass

lanthanoids	57 La lanthanum 139	58 Ce cerium 140	59 Pr praseodymium 141	60 Nd neodymium 144	61 Pm promethium –	62 Sm samarium 150	63 Eu europium 152	64 Gd gadolinium 157	65 Tb terbium 159	66 Dy dysprosium 163	67 Ho holmium 165	68 Er erbium 167	69 Tm thulium 169	70 Yb ytterbium 173	71 Lu lutetium 175
actinoids	89 Ac actinium –	90 Th thorium 232	91 Pa protactinium 231	92 U uranium 238	93 Np neptunium –	94 Pu plutonium –	95 Am americium –	96 Cm curium –	97 Bk berkelium –	98 Cf californium –	99 Es einsteinium –	100 Fm fermium –	101 Md mendelevium –	102 No nobelium –	103 Lr lawrencium –

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

NEW TOWN SECONDARY SCHOOL
MID-YEAR EXAMINATION 2017
SECONDARY 1 EXPRESS

PART 1: CHEMISTRY
ANSWER SCHEME

SECTION A

Question	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Answer	B	A	C	D	B	A	D	C	B	A

SECTION B

11(a)	Substance **A** It is **a good electrical conductor** and has **high melting point.** [State both reasons for 1 m]	1 1
11(b)	**Flexibility** **Glass is not flexible while plastic is flexible.** [Accept other plausible answers]	1 1
12(a)	Measuring cylinder (Drawing of measuring cylinder)	1 1
12(b)	Yes her observation is correct. A suspension is formed since the **cross cannot be seen** after hydrochloric acid has been added. This shows that the **mixture is opaque / there are solid particles / particles covering the cross,** characteristic of a suspension.	 1 1
12(c)i	Independent variable: **Temperature** of mixture Dependent variable: **Time taken for cross to disappear**	1 1
12(c)ii	**Volume of hydrochloric acid / Volume of sodium thiosulfate / Size of cross** [Any two variables]	2
12(c)iii	She should **open the air-hole.** This will allow her to get a **non-luminous flame which is hotter.**	1 1
13(a)	**Temperature** **Nature of solvent**	1 1
13(b)i	**Iodine**	1
13(b)ii	A pure substance that **cannot be broken down in any simpler substance by chemical means.**	1
13(c)	She should **soak the dress in ethanol.** **Ethanol can dissolve more iodine** than water at the same temperature.	1 1