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BENDEMEER SECONDARY SCHOOL

2021 PRELIMINARY EXAMINATION

Register No.	Class

Name _____

BENDEMEER SECONDARY SCHOOL

2021 PRELIMINARY EXAMINATION

SECONDARY 4 NORMAL (TECHNICAL)

SCIENCE SYLLABUS 1 PAPER 1

5148/01

DATE : 13 August 2021
DURATION : 1 hour

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.

Write your name, class and register number on the work you hand in.

Do not use paper clips, glue or correction fluid.

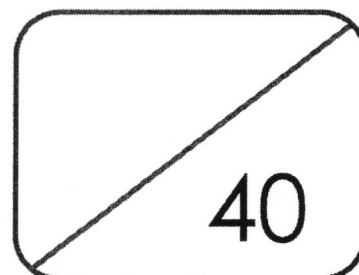
There are **forty** questions on this paper. Answer **all** questions. For each question, there are four possible answers **A, B, C** and **D**.

Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

Read the instructions on the Answer sheet very carefully.

Each correct answer will score one mark. A mark will not be deducted for a wrong answer. Any rough working should be done in this booklet.

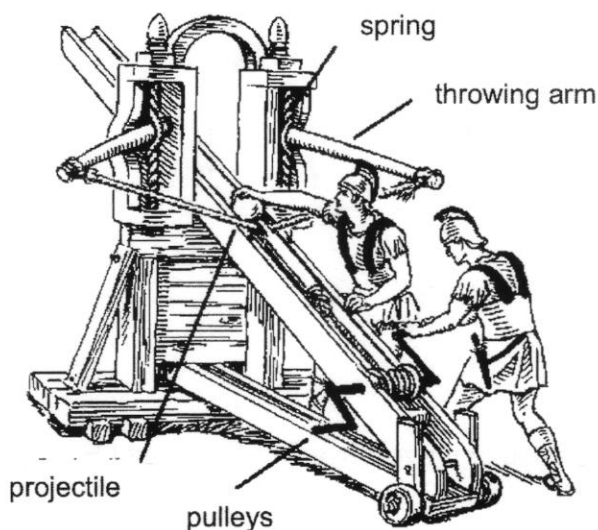
The use of an approved scientific calculator is expected, where appropriate.



This document consists of **14** printed pages.

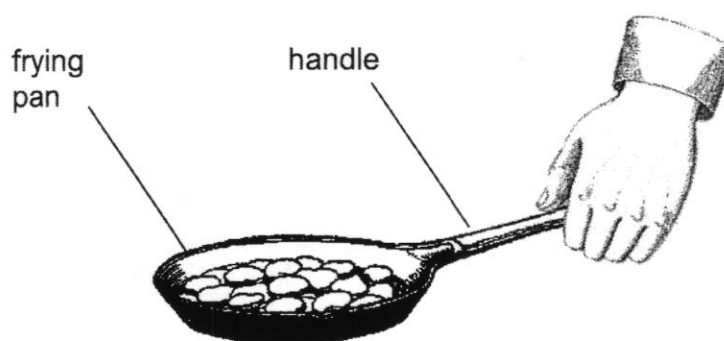
[Turn over

- 1 The diagram below shows a catapult.



Which type of energy is possessed by the stretched spring in the diagram above?

- A chemical potential energy
 - B elastic potential energy
 - C gravitational potential energy
 - D kinetic energy
- 2 A chef is frying some nuggets using a frying pan as shown in the diagram below.



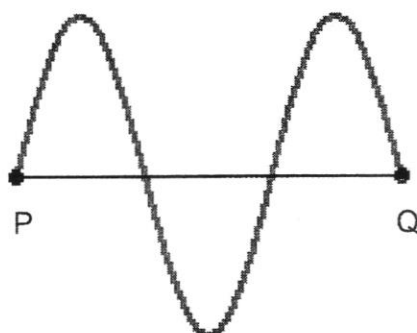
After a few minutes, the chef feels that the handle is hot.

Why is this so?

- A Thermal energy is created by the hand.
- B Thermal energy is created by the frying pan.
- C Thermal energy is transferred from the frying pan to the hand through the handle.
- D Thermal energy is transferred from the hand to the frying pan through the handle.

[Turn over

For questions 3 and 4, refer to the diagram below.



- 3 The waveforms of a particular wave travelling from point P to Q is shown in the diagram above.

How many complete waves is/are shown?

- A 1 B 1.5 C 2 D 3

- 4 If the time taken for the wave to travel from point P to Q is 5 seconds.

What is the frequency of the wave?

- A 0.3 Hz B 0.5 Hz C 3.0 Hz D 5.0 Hz

- 5 Which pair shows the correct electromagnetic wave and its usage?

	electromagnetic wave	usage
A	microwave	mobile phones
B	infra-red	sunbeds
C	ultra-violet	television communications
D	X-ray	optical fibres

- 6 Which of the following statements concerning friction is **incorrect**?

- A Effects of friction can be reduced by using ball bearings and lubricants.
 B Friction always acts in the same direction of motion of the object.
 C Friction always opposes motion.
 D Friction causes wear and tear.

[Turn over

- 7 A boy running at 2.0 m/s suddenly increases his speed to 7.0 m/s within 5.0 s.

What was his acceleration?

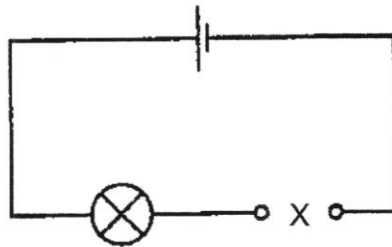
- A** 1.0 m/s² **B** 1.8 m/s² **C** 4.5 m/s² **D** 5.0 m/s²

- 8 A force can be a push or a pull.

Which of the following actions is wrongly matched to the type of force?

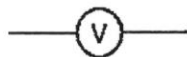
	action	type of force
A	opening the door of a fridge	pull
B	pressing a key on a keyboard	push
C	chopping carrots using a knife	both push and pull
D	squeezing a sponge	both push and pull

- 9 An electrical component is to be placed at X in the circuit shown, to vary the brightness of the lamp.



What should be connected at X?

A



B



C



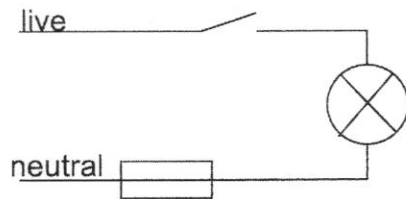
D



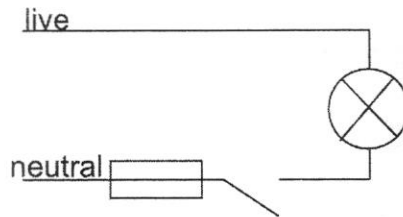
[Turn over

- 10 Which of the following circuits shows the correct arrangement for a fuse and a switch for controlling the lamp?

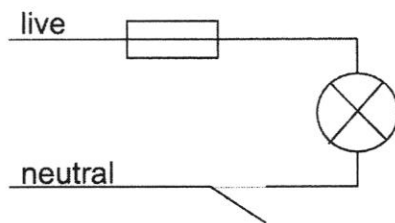
A



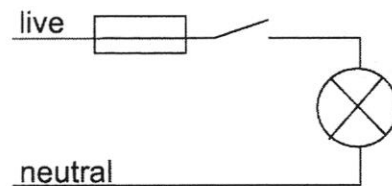
B



C



D



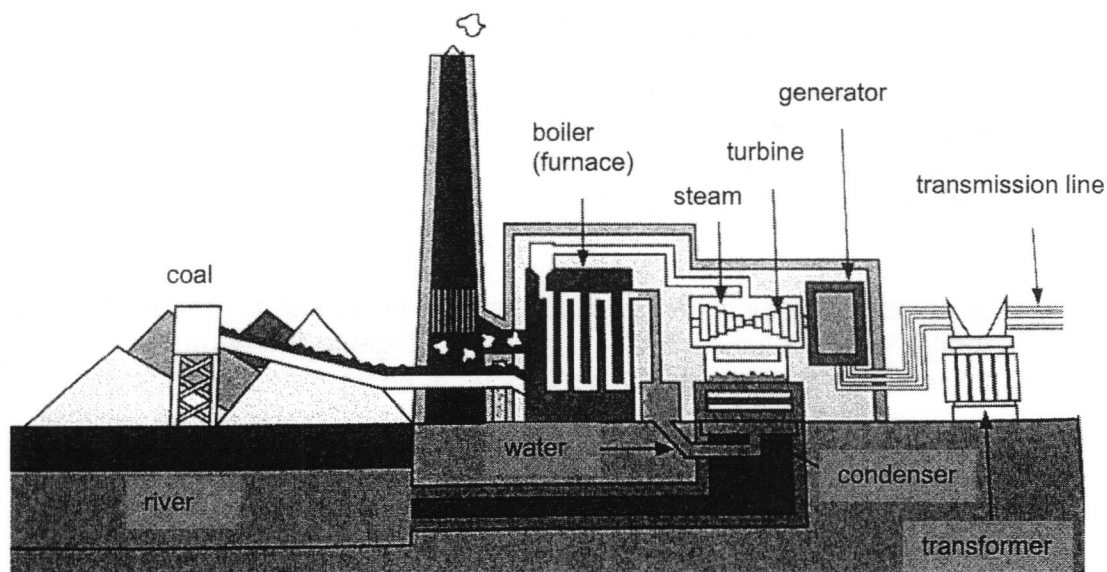
- 11 An electric iron is rated at 6 kW and is turned on for 10 hours.

What is the cost of using this iron if 1 kWh of electrical energy costs 20 cents?

- A 3 cents B 6 cents C 60 cents D 1200 cents
- 12 From the school's power substation to the classroom, transformers are used to
- A step-down the electrical voltage supplied.
 - B step-down the electrical power supplied.
 - C step-up the electrical power supplied.
 - D step-up the electrical power supplied.

[Turn over

- 13 A fossil-fuel power station is as shown below.



What is the overall energy conversion?

- A chemical to heat
 - B chemical to electrical
 - C heat to electrical
 - D heat to kinetic
- 14 Which of the following are **not** conditions required for plants to produce food?
- A carbon dioxide
 - B fertile soil
 - C oxygen
 - D water
- 15 Which of the following is **not** an advantage of the slash-and-burn method used in agriculture?
- A Ashes from the burnt trees provide nutrients to the soil.
 - B It increases the air temperature.
 - C It is cheap and fast method in clearing land.
 - D It reduces the occurrence of pests.

[Turn over

- 16 A crop requires an optimal pH of 9. However, the soil in the farmland has a pH of 5.8.

What can the farmer do to bring the pH of the soil closer to the optimal pH?

- A add acidifying fertilisers to the soil
- B add calcium hydroxide to the soil
- C add more pesticides to the farmland
- D irrigate the soil with a lot of water

- 17 Ethylene is widely used in chemical industry, and its worldwide production (over 109 million tonnes in 2006) exceeds that of any other organic compound.
Ethylene is used in agriculture to speed up the ripening of fruits, example banana.

What is ethylene being used as in the ripening of banana?

- A biological control
- B herbicides
- C pesticides
- D plant hormones

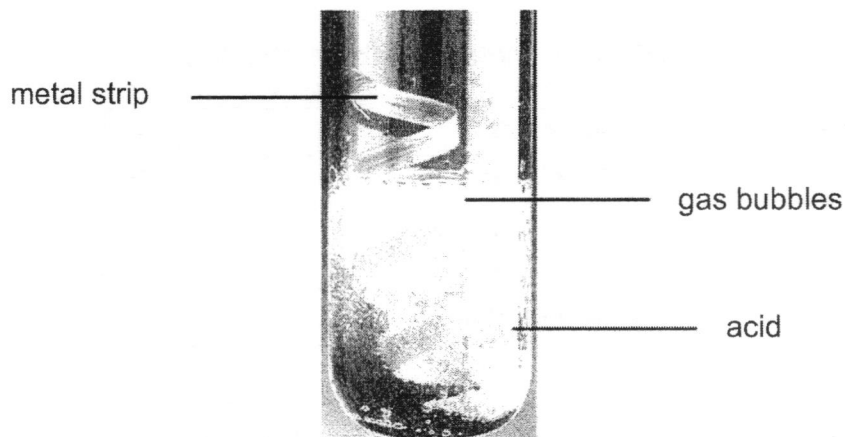
- 18 Which of the following are **not** chemical changes?

- I Bread turns mouldy after expiry date.
- II Drying of shrimps under the sun.
- III Preserving cucumbers in vinegar.
- IV Roasting chicken in an oven.

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

[Turn over

- 19 When a strip of metal is put in a test tube filled with acid, gas bubbles were observed.



What gas is released from the reaction of the metal with acid?

- A carbon dioxide
 - B hydrogen
 - C nitrogen
 - D oxygen
- 20 Which of the following statement about acids is correct?
- A Acids taste sour.
 - B Acids prevent rusting.
 - C Acids turn red litmus paper blue.
 - D Acids produce bubbles with water.
- 21 The rust formed on a steel knife contains metal oxide which is a base.
- Which of the following substances **cannot** be used to remove it?
- A antacids
 - B carbonated drink
 - C lemon juice
 - D vinegar
- 22 Which of the following is **not** an application of neutralisation?
- A baking powder
 - B fabric softener
 - C hair conditioner
 - D preventing tooth decay

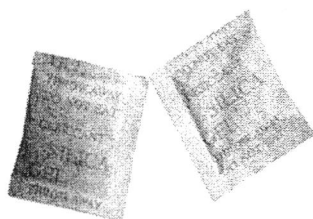
[Turn over

- 23** The table below shows the colour observed when iodine test and biuret test were performed on a few food samples.

Which food sample, **A**, **B**, **C** or **D**, contains both starch and proteins?

food sample	iodine test	biuret test
A	yellow brown	purple
B	blue black	purple
C	blue black	blue
D	yellow brown	blue

- 24** A packet of mooncakes is packed with drying agents as shown below.



packets of drying agent

What is the function of the drying agent?

- A** to reduce microbial activity by reducing oxygen content
 - B** to reduce microbial activity by reducing water content
 - C** to reduce the temperature of the mooncake
 - D** to repel the microbes away from the mooncake
- 25** A baker wants to improve the attractiveness of his cakes.

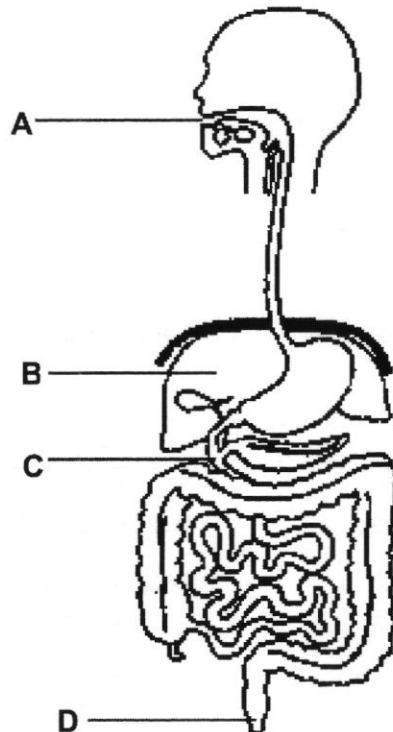
What is the best method to do so?

- A** add salt
- B** add starch
- C** add preservatives
- D** add food colourings

[Turn over

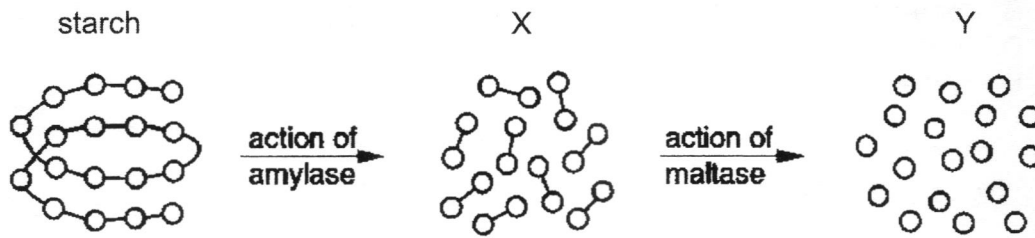
- 26 Which of the following is **not** an example of a micro-organism?
- A bacteria
 - B bed bug
 - C yeast
 - D virus
- 27 Which of the following is **incorrect** about digestion?
- A Both physical and chemical digestion takes place in the mouth.
 - B Enzymes needed for digestion are only produced in some parts of the digestive system.
 - C In chemical digestion, all nutrients are broken down into smaller and soluble molecules.
 - D In physical digestion, large and insoluble food molecules are broken into smaller and soluble ones.
- 28 The diagram shows part of the digestive system.

Which part of the digestive system is pancreatic juice released into?



[Turn over

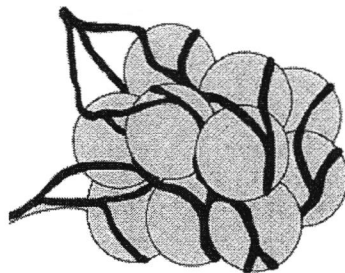
- 29 The diagrams show how the enzymes amylase and maltase break down a starch molecule into smaller molecules.



What are molecules X and Y?

	X	Y
A	fatty acids	glycerol
B	glucose	maltose
C	maltose	glucose
D	simpler proteins	amino acids

- 30 The lungs contain air sacs surrounded by rich blood vessels.



Which of the following best describes how oxygen and carbon dioxide are exchanged in the air sacs?

	oxygen	carbon dioxide
A	moves from air sacs into surrounding blood vessels	moves from air sacs into surrounding blood vessels
B	moves from air sacs into surrounding blood vessels	moves from surrounding blood vessels to air sacs
C	moves from surrounding blood vessels to air sacs	moves from air sacs into surrounding blood vessels
D	moves from surrounding blood vessels to air sacs	moves from surrounding blood vessels to air sacs

[Turn over

- 31 What happens to the muscles and the position of the diaphragm when breathing in?

	muscles of diaphragm	movement of diaphragm
A	contract	downwards
B	contract	upwards
C	relax	downwards
D	relax	upwards

- 32 People who inhale cigarette smoke from smokers around them are known as

- A** active smokers.
- B** chain smokers.
- C** passive smokers.
- D** addicted smokers.

- 33 Which of the statement best describe fitness?

- A** The ability to do mental activities without feeling sick or tired.
- B** The ability to do physical activities without feeling sick or prolonged tiredness.
- C** The ability to do useful physical activities once in a while without feeling sick or tired.
- D** The ability to do useful physical activities without any complaints from the person.

- 34 A student's body mass is 62 kg and height is 159 cm.

Given the formula to calculate Body Mass Index (BMI) below, what is the student's BMI?

$$\text{BMI} = \frac{\text{body mass (kg)}}{\text{height}^2 (\text{m}^2)}$$

- A** 0.0025 **B** 1.59 **C** 24.5 **D** 62
- 35 Which best describes the main function of platelets?

- A** helps to fight infection by producing antibodies
- B** stop bleeding by forming a mesh and clotting blood
- C** transport dissolved carbon dioxide
- D** transport dissolved oxygen

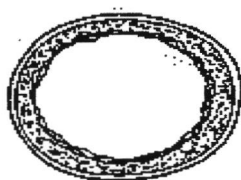
[Turn over

- 36 What type of joint problem is shown in the X-ray image below?



- A arthritis
- B dislocation
- C fracture
- D sprain

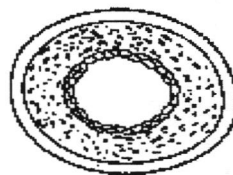
- 37 The diagram shows cross-sections of three types of blood vessel, not drawn to the same scale.



X



Y



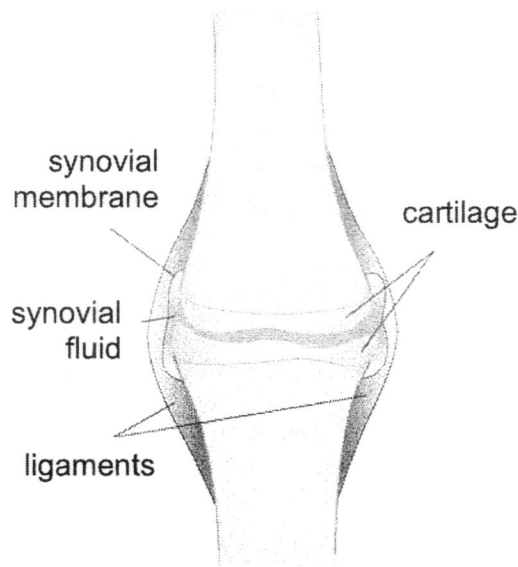
Z

What are X, Y and Z?

	X	Y	Z
A	artery	capillary	vein
B	artery	vein	capillary
C	vein	artery	capillary
D	vein	capillary	artery

[Turn over

- 38 The diagram below shows parts of a joint.



Mary is 70 years old. She has swollen finger joints and her cartilage is worn out.

What condition does Mary most likely suffer from?

- A a sprain
 - B dislocation of her finger joints
 - C arthritis of her finger joints
 - D fracture of the bones of her fingers
- 39 Which of the following is a limitation of kidney transplant as compared to kidney dialysis?
- A it is not permanent
 - B life-long dependence on machine
 - C need to depend on immuno-suppressant medicines
 - D need to be connected to the dialysis machine for hours every week
- 40 There are several compulsory vaccinations for babies and children. Adults are also vaccinated throughout their lives.

Which of the following statements best explains the reason for this?

- A Vaccinations are a cure for bacterial infection.
- B Vaccinations are a cure for viral infection.
- C Vaccinations protect us against bacterial infection.
- D Vaccinations protect us against viral infection.

END OF PAPER

[Turn over

Name _____

Register No.	Class

BENDEMEER SECONDARY SCHOOL
2021 PRELIMINARY EXAMINATION
SECONDARY 4 NORMAL (TECHNICAL)
SCIENCE SYLLABUS 1 PAPER 2

5148/02

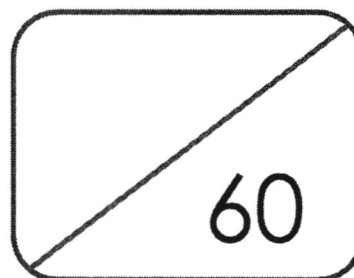
DATE : 13 August 2021
DURATION : 1 hour 15 minutes

READ THESE INSTRUCTIONS FIRST

Write your name, class and register number on the work you hand in.
You may use a 2B pencil for any diagrams, graphs, tables or rough working.
Do not use paper clips, glue or correction fluid.

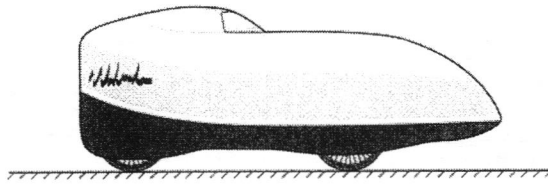
The use of an approved scientific calculator is expected, where appropriate.

Answer **all** questions.



This document consists of **14** printed pages.

- 1 The figure below shows a special bicycle used to break the world speed record for a human-powered bicycle.



- (a) On one run along a measured distance of 1200 m, the rider completed the run in 0.5 minutes.

Calculate the speed of this special bicycle in m/s.

speed = m/s [2]

- (b) After pedalling at a constant speed for 0.5 minutes, the rider comes to a stop and rests for another 0.5 minutes.

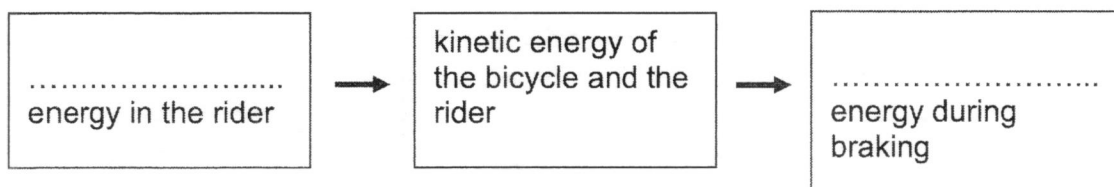
Sketch the shape of the distance-time graph for this motion and label the values clearly on the axes.



[2]

[Turn over

- (c) Complete the sequence of energy transfers that occurs during the run.



[2]

- 2 (a) The table below lists a few common electrical devices.

Indicate the power source of each device by ticking (✓) the correct box.

	electrical device	batteries	mains power supply
(i)	washing machine		
(ii)	hand-held torchlight		
(iii)	refrigerator		
(iv)	wall clock		

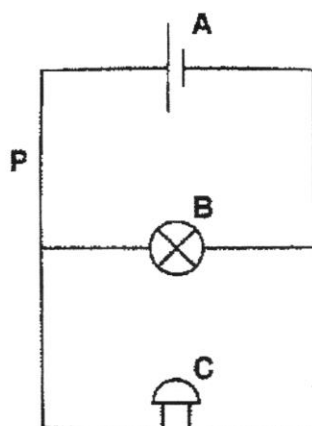
[2]

- (b) What is the advantage for using batteries for some devices?

.....

[1]

- 3 (a) The diagram shows a circuit, with three components, **A**, **B** and **C**.



State the name of components **A**, **B** and **C**.

A

B

C

[3]

- (b) (i) The total current through the circuit is 9 A.
The current through component **B** is 4 A.

Deduce the current through component **C**.

..... A [1]

- (ii) State the current passing through the wire at point **P**.

..... A [1]

- (c) A student measures the voltage across component **C**.

Use the circuit symbol for a voltmeter to show where the voltmeter should be placed in the circuit.

Draw your answer on the diagram in part (a).

[1]

[Turn over

4 A farmer has been using pesticides and herbicides on his crops.

(a) Explain how using pesticides and herbicides can help to increase crop yield?

.....

.....

.....

.....

[2]

(b) The population of birds in the farm was observed to decrease over time after the use of pesticides and herbicides.

(i) Suggest an alternative method that the farmer could use which will not result in the decrease of the bird population.

.....

[1]

(ii) What are the two advantages of the method described in (i)?

.....

.....

.....

.....

[2]

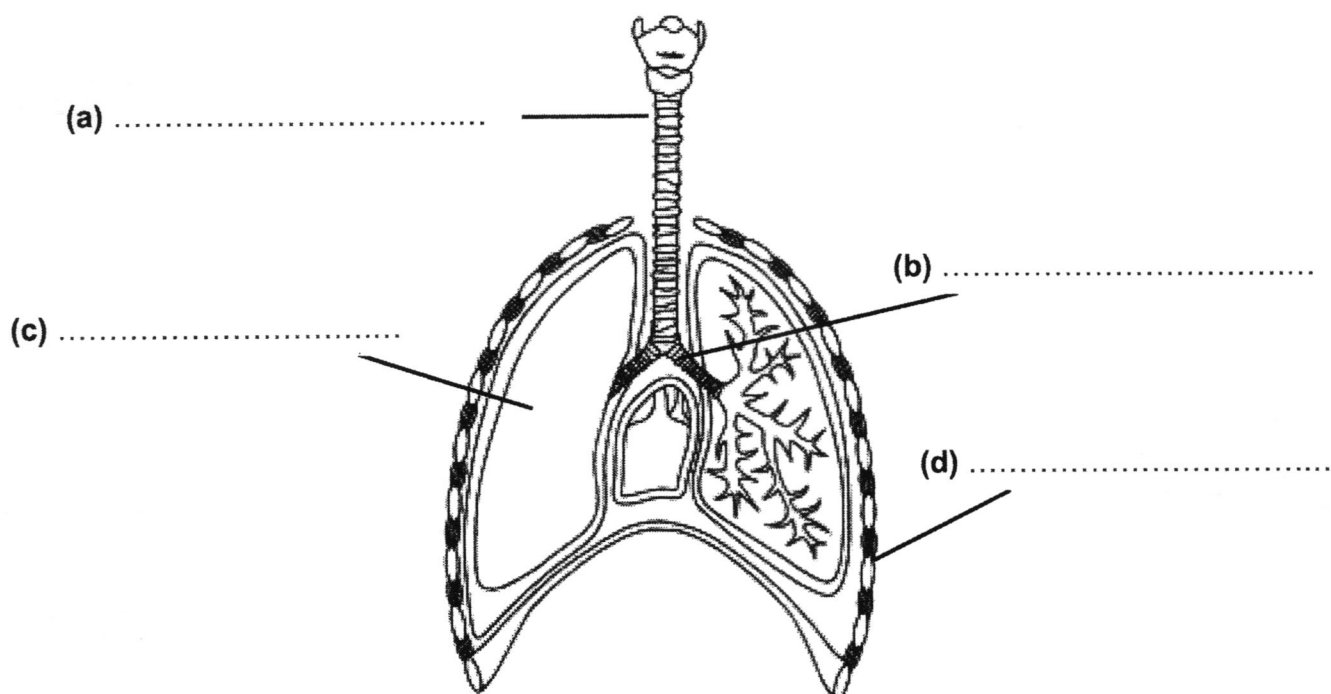
- 5 Match the most appropriate separation techniques in the examples shown.

evaporation	distillation	chromatography	filtration	dissolving
-------------	--------------	----------------	------------	------------

	example	separation technique
(a)	When cooking noodles, the fastest way to separate the noodles from the boiling water is to pour the contents of the pot into a strainer.	
(b)	Salt mines extract salt from seawater when temperatures are high.	
(c)	Pure drinking water in the Middle East is obtained from seawater.	
(d)	Dyes in food colourings are tested for safe consumption.	

[4]

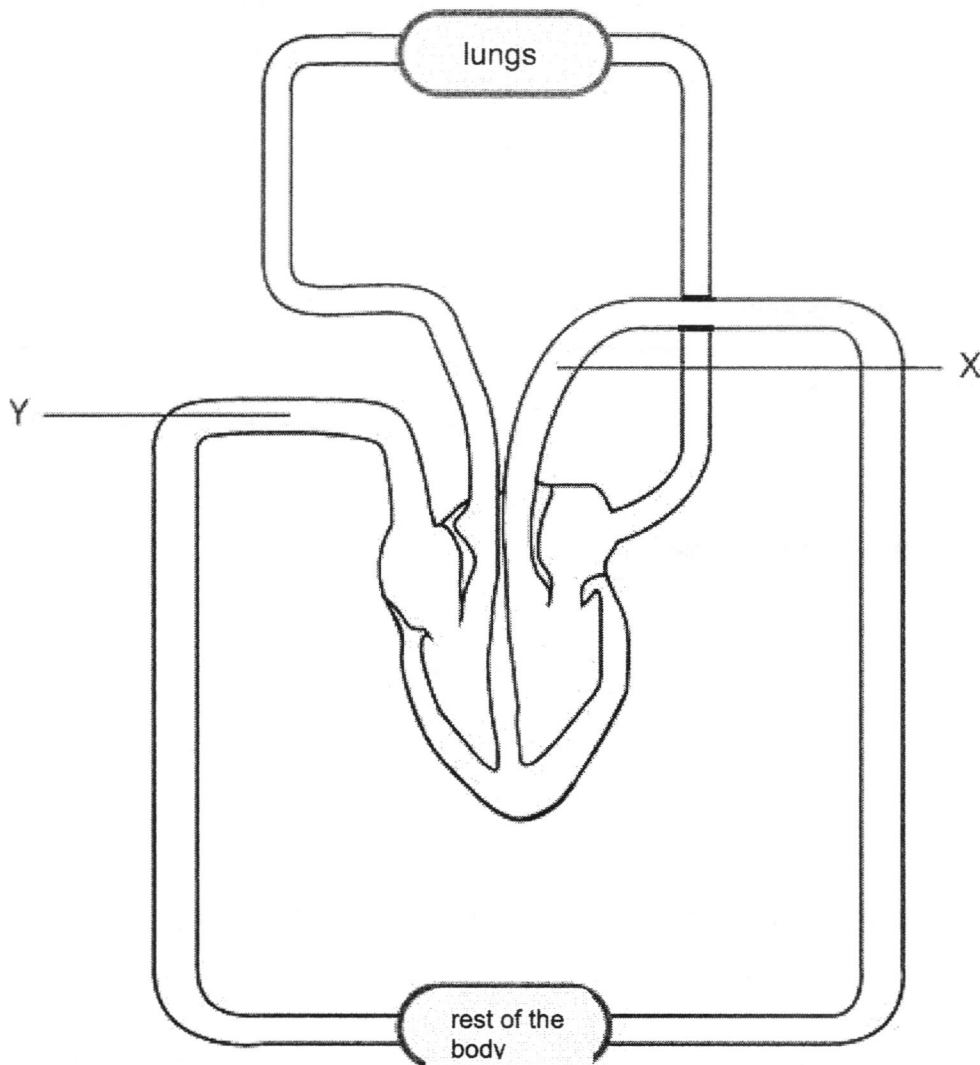
- 6 The diagram shows part of the human respiratory system. Label the diagram below.



[4]

[Turn over

- 7 Study the diagram below showing the human circulatory system and answer the following questions.



- (a) Draw arrows in the diagram above to show how blood moves between the heart, lungs and the rest of the body. [2]
- (b) (i) Identify the type of blood vessel labelled Y. [1]
-
- (ii) What is the difference in the composition of blood in vessel X compared to the blood in vessel in Y? [1]
-

8 Diseases can be transmissible or non-transmissible.

- (a) Complete the table below to identify which diseases are transmissible or non-transmissible. An example has been done for you.

disease	transmissible	non-transmissible
Influenza	✓	
colon cancer		
diabetes		
SARS		
coronary heart disease		
dengue fever		
stroke		

[3]

- (b) Suggest one way to help your friend manage his/ her stress.

.....

.....

[1]

9 Explain the harmful effects on health of each of the following scenarios.

- (a)** Listening to very loud music for long periods of time through headphones or earpieces.

.....
.....

[1]

- (b)** Patient did not fully complete a course of prescribed antibiotics.

.....
.....

[1]

- (c)** Eating too much of convenience food or fast food.

.....
.....

[1]

- (d)** Failing to use disinfectants regularly to clean kitchen work surfaces.

.....
.....

[1]

- 10 The following shows two food labels for potato chips.

potato chips A

Nutrition Facts	
Serving Size 1 oz. (28g/About 15 chips)	
Amount Per Serving	
Calories 160	Calories from Fat 90
% Daily Value*	
Total Fat 10g	15%
Saturated Fat 1g	8%
Trans Fat 0g	
Polyunsaturated Fat 4.5g	
Monounsaturated Fat 4.5g	
Cholesterol 0mg	0%
Sodium 170mg	7%
Potassium 420mg	12%
Total Carbohydrate 16g	5%
Dietary Fiber 1g	5%
Sugars 2g	
Protein 2g	
Vitamin A 6%	Vitamin C 10%
Calcium 2%	Iron 4%

potato chips B

Nutrition Facts	
Serving Size 1 oz (28g/About 16 crisps)	
Amount Per Serving	
Calories 120	Calories from Fat 30
% Daily Value*	
Total Fat 3g	5%
Saturated Fat 0.5g	3%
Trans Fat 0g	
Polyunsaturated Fat 1.5g	
Monounsaturated Fat 1g	
Cholesterol 0mg	0%
Sodium 190mg	8%
Potassium 220mg	6%
Total Carbohydrate 22g	7%
Dietary Fiber 2g	7%
Sugars 3g	
Protein 2g	
Vitamin A 2%	Vitamin C 2%
Calcium 0%	Iron 0%
Niacin 6%	

- (a) Which of the potato chips is considered healthier? Explain your answer.

.....
 [2]

- (b) Which of the potato chips is more suitable for patients with anaemia (low count of red blood cells)? Explain your answer.

.....
 [2]

- (c) Name a nutrient in potato chips **A** that is important for the following purposes:

- (i) building resistance to infection

..... [1]

- (ii) tissue growth and repair

..... [1]

[Turn over

- (d) Calculate the total amount of calories you would have consumed if you consume two servings of potato chips **A**.

..... [2]

- (e) The table below shows the recommended Daily Values (DV) of a 2000 calorie diet.

food component	Daily Values (DV)
total fat	65 g
saturated fat	20 g
cholesterol	300 mg
sodium	2400 mg
total carbohydrate	300 g
dietary fibre	25 g

Show the steps to obtain 15 % DV total fat for potato chips **A**.

[2]

- 11 In experiment 1, a student investigated how concentration of enzyme affected the rate of protein digestion at 25 °C. A second experiment was repeated (experiment 2) but at 37 °C.

The results are shown below.

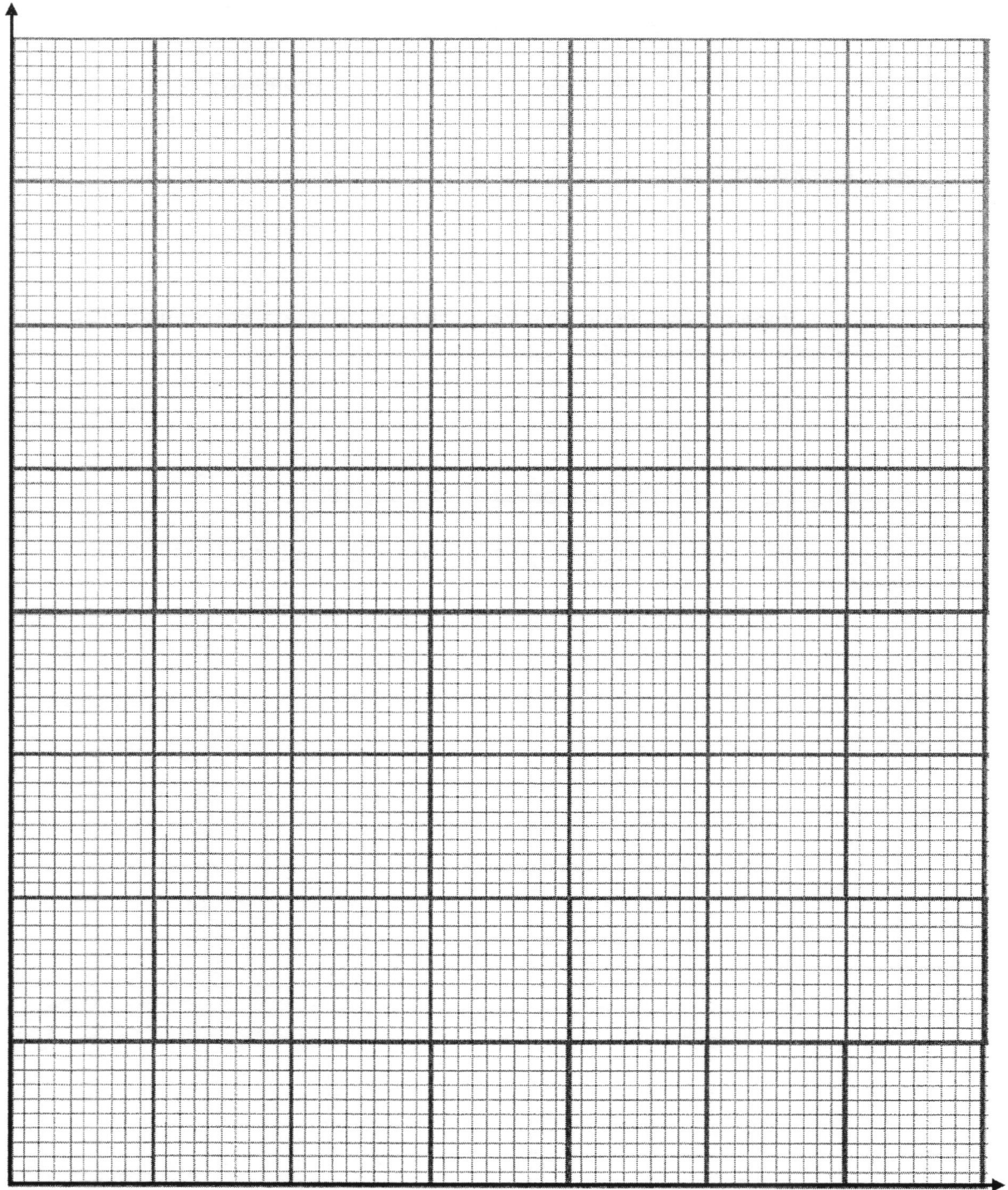
concentration of enzyme/ arbitrary units	experiment 1/ products formed per min	experiment 2/ products formed per min
0	0	0
20	34	65
40	52	84
60	62	96
80	70	104
100	72	110
120	75	112
140	76	113

- (a) Plot the results of experiment 1 and 2 accurately on the grid on page 13.

Use smooth curves to connect the points for each experiment.

Label each curve either as experiment 1 or experiment 2.

concentration of enzyme/ arbitrary units



products formed per min

[5]

- (b) Use the graphs to find the rate of protein digestion at enzyme concentration of 55 arbitrary units for

(i) experiment 1, and

rate = products formed per min [1]

(ii) experiment 2.

rate = products formed per min [1]

- (c) Using the graphs drawn, state how increasing the temperature from 25 °C to 37 °C affects the rate of protein digestion.

..... [1]

- (d) In another experiment, the temperature used was 100 °C.

Suggest what happens to the enzyme and the effect on the rate of protein digestion.

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

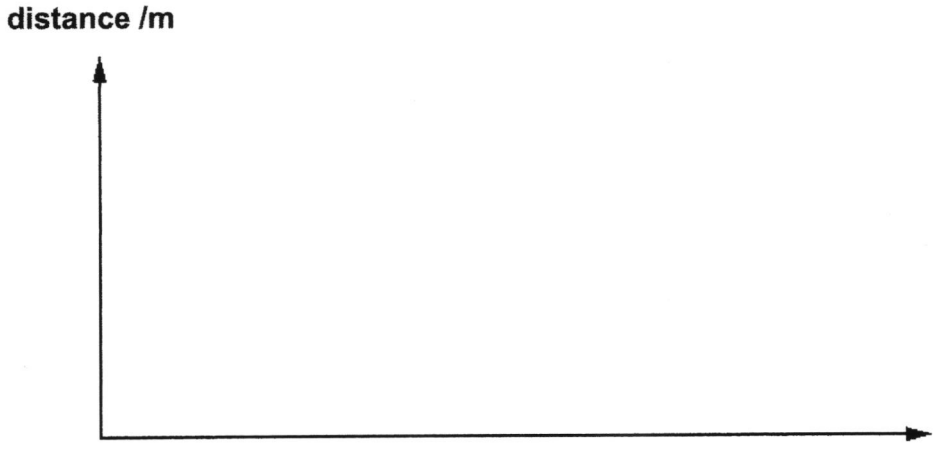
END OF PAPER

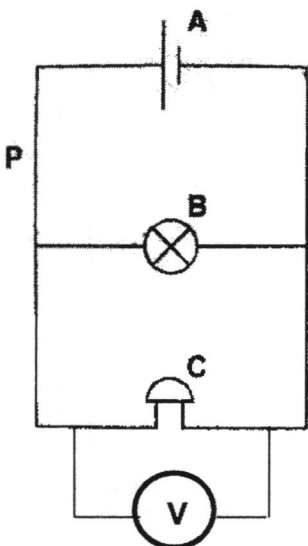
BENDEMEER SECONDARY SCHOOL
2021 PRELIMINARY EXAMINATION
SEC 4 NORMAL TECHNICAL SCIENCE [MARKING SCHEME]

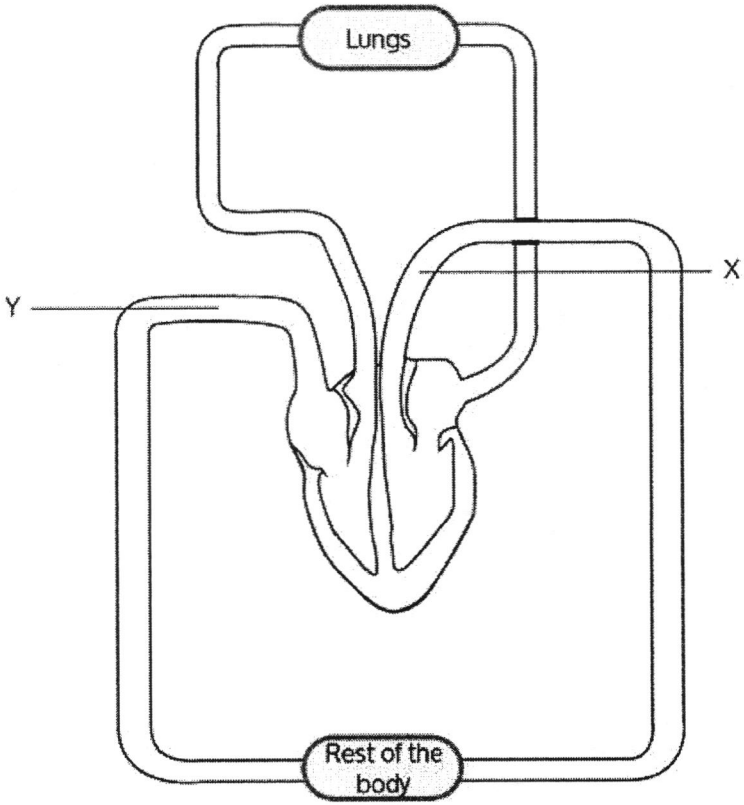
Section A: Multiple Choice Questions [40 marks]

1	B	11	D	21	A	31	A
2	C	12	A	22	A	32	C
3	B	13	B	23	B	33	B
4	A	14	C	24	B	34	C
5	A	15	B	25	D	35	B
6	B	16	B	26	B	36	B
7	A	17	D	27	D	37	D
8	D	18	C	28	C	38	C
9	C	19	B	29	C	39	C
10	D	20	A	30	B	40	D

Section B: Short Answer Questions [60 Marks]

		Marks
1(a)	$\text{speed} = \frac{\text{distance}}{\text{time}}$ $= \frac{1200 \text{ m}}{(0.5 \text{ min} \times 60\text{s})}$ $= \frac{1200 \text{ m}}{30 \text{ s}}$ $= 40 \text{ m/s}$	 1 m 1 m
(b)		1 m 1 m

(c)	chemical potential heat	1 m 1 m																				
2(a)	Each correct answer - ½ m <table><tr><td></td><td>electrical device</td><td>batteries</td><td>mains power supply</td></tr><tr><td>(i)</td><td>washing machine</td><td></td><td>✓</td></tr><tr><td>(ii)</td><td>hand-held torchlight</td><td>✓</td><td></td></tr><tr><td>iii)</td><td>refrigerator</td><td></td><td>✓</td></tr><tr><td>(iv)</td><td>wall clock</td><td>✓</td><td></td></tr></table>		electrical device	batteries	mains power supply	(i)	washing machine		✓	(ii)	hand-held torchlight	✓		iii)	refrigerator		✓	(iv)	wall clock	✓		2 m
	electrical device	batteries	mains power supply																			
(i)	washing machine		✓																			
(ii)	hand-held torchlight	✓																				
iii)	refrigerator		✓																			
(iv)	wall clock	✓																				
(b)	portable/ hand-held/ able to carry around	1 m																				
3(a)	A - dry cell B - bulb C - bell	1 m 1 m 1 m																				
(b)	(i) 9 A – 4 A = 5 A	1 m																				
	(ii) 9 A	1 m																				
(c)		1 m																				
4(a)	Pesticides – help to kill pests Herbicides – help to remove weeds	1 m 1 m																				

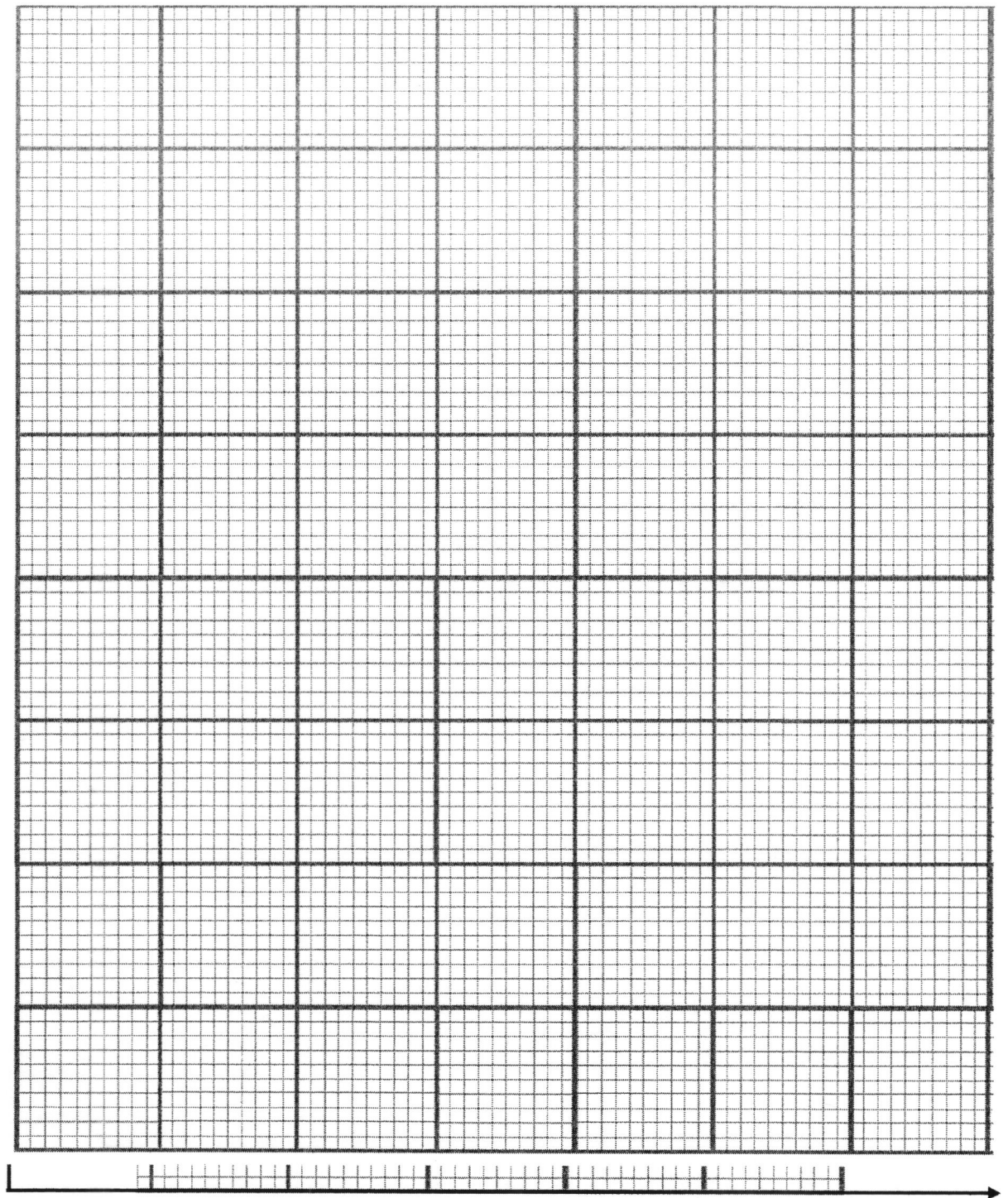
(b)	(i) biological control / use of natural predator	1 m
	(ii) Any two answers	2 m
	• No water contamination • No soil contamination • No accumulation of chemicals in the animals in the food chain	
5	(a) filtration	1 m
	(b) evaporation	1 m
	(c) distillation	1 m
	(d) chromatography	1 m
6	(a) windpipe/ trachea	1 m
	(b) bronchus	1 m
	(c) lungs	1 m
	(d) ribcage	1 m
7(a)	Each arrow head in the right direction – ½ m	2 m
		
(b)	(i) vein	1 m
	(ii) oxygenated blood	1 m

8(a)	Each correct answer – ½ m	3 m																								
	<table border="1"> <thead> <tr> <th>disease</th><th>transmissible</th><th>non-transmissible</th></tr> </thead> <tbody> <tr> <td>Influenza</td><td>✓</td><td></td></tr> <tr> <td>colon cancer</td><td></td><td>✓</td></tr> <tr> <td>diabetes</td><td></td><td>✓</td></tr> <tr> <td>SARS</td><td>✓</td><td></td></tr> <tr> <td>coronary heart disease</td><td></td><td>✓</td></tr> <tr> <td>dengue fever</td><td></td><td>✓</td></tr> <tr> <td>stroke</td><td></td><td>✓</td></tr> </tbody> </table>	disease	transmissible	non-transmissible	Influenza	✓		colon cancer		✓	diabetes		✓	SARS	✓		coronary heart disease		✓	dengue fever		✓	stroke		✓	
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stroke		✓																								
(b)	Any one of the answer / any other valid point • carry out exercise • involve in any favourite hobby • meet friends and share problems with friends • get enough rest	1 m																								
9(a)	Loud music may affect the function of ear drum and ability to hear clearly and properly	1 m																								
(b)	Remaining bacteria may multiply and cause infection again.	1 m																								
(c)	Convenience/ fast foods contain high amount of salt, sugar, fats and can cause high blood pressure, diabetes, and kidney problems.	1 m																								
(d)	Micro-organisms may grow and multiply on surfaces	1 m																								

10(a)	Potato chips B Contains lesser fats/ lesser calories	1 m 1 m
(b)	Potato chips A Contains 4% iron / more iron than B	1 m 1 m
(c)	(i) vitamin C (ii) protein	1 m 1 m
(d)	1 servings - 160 calories 2 servings - 160 x 2 = 320 calories	2 m
(e)	% DV total fat = $\frac{\text{total fat in food (g)}}{\text{recommended DV total fat (g)}}$ = $\frac{10 \text{ g}}{65 \text{ g}} \times 100 \%$ = 15.4% ~ 15% [shown]	1 m 1 m
11(a)	graph on next page 1 m – correct axis interval for y-axis 1 m – correct axis interval for x-axis 1 m – plotting of data points for Experiment 1 1 m – plotting of data points for Experiment 2 1 m – smooth curve for both graphs	5 m
(b)	(i) 60 products formed per min	1 m
	(ii) 94 products formed per min	1 m
(c)	Increases protein digestion	1 m
(d)	Enzyme denatured. No protein digestion.	1 m 1 m

11(a)

concentration of enzyme/ arbitrary units



products formed per min