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DAMAI SECONDARY SCHOOL

End-of-Year Examination 2022

CANDIDATE NAME

CLASS

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INDEX NUMBER

--	--

SCIENCE

10 October 2022

Secondary 2 Express

2 hours

Setter: Ms Lenny Marlina

100 marks

Additional Materials: Multiple Choice Answer Sheet
Answer Booklet

READ THESE INSTRUCTIONS FIRST

Write your name, index number and class on all the work you hand in.
Write in dark blue or black ink on both sides of the paper.
You may use an 2B pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction tape.

Section A

There are **forty** 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 Multiple Choice 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.
In calculations, you should show all the steps in your working, giving your answer at each stage.
The number of marks is given in brackets [] at the end of each question or part question.

You are advised to spend no more than **60 minutes** on Section A.

You may proceed to answer Section B as soon as you have completed Section A.

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

This document consists of **26** printed pages.

[Turn over

Section A

Answer **all** the questions on the separate Answer Sheet.

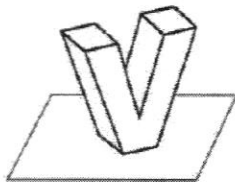
- 1 Which of the following **cannot** be changed by applying a force?

- A direction
- B mass
- C speed
- D shape

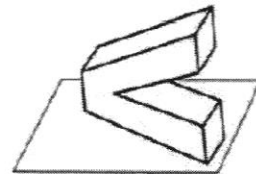
- 2 The diagrams below show a V-shaped object placed in different orientations.

In which orientation does the object exert maximum pressure on the surface it is resting?

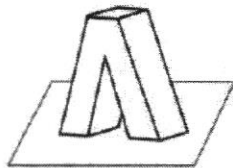
A



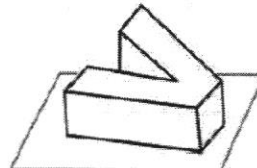
B



C



D



- 3 In Brazil, crops like corn and sugarcane are grown and converted into alcohol to be used as fuel for vehicles.

What energy source was described above?

- A biofuels
- B fossil fuels
- C geothermal
- D nuclear

- 4 A girl pushes against a wall with an 80 N force. The wall did not move.

What is the work done by the girl?

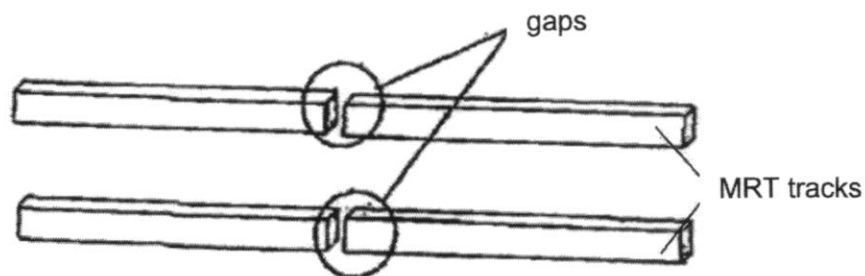
- A 0 J
- B 32 J
- C 80 J
- D 3200 J

- 5 The gravitational field strength is 2 N/kg on the Moon and 10 N/kg on the Earth. An astronaut who was originally on the Moon heads to the Earth.

What effect does this have on the astronaut's mass and weight?

	mass	weight
A	less on Earth	same on the Earth and Moon
B	more on Earth	same on the Earth and Moon
C	same on the Earth and Moon	less on Earth
D	same on the Earth and Moon	more on Earth

- 6 MRT tracks are designed and laid out such that there are gaps between sections of the track, as shown in the diagram below.



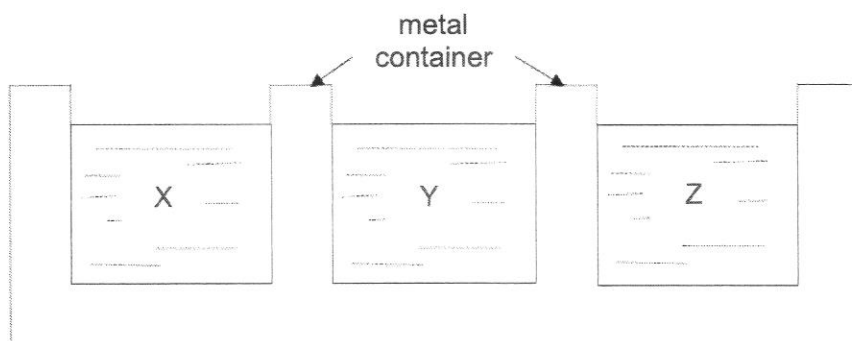
What is the main reason for having gaps in the train tracks?

- A It allows for contraction of the track during cold weather.
- B It allows for expansion of the track during hot weather.
- C It allows the tracks to be removed easily for repair.
- D It allows the trains to travel more smoothly.

[Turn over

4

- 7 A metal container consists of three compartments, X, Y and Z. Each compartment contains an equal amount of water but at different temperatures.

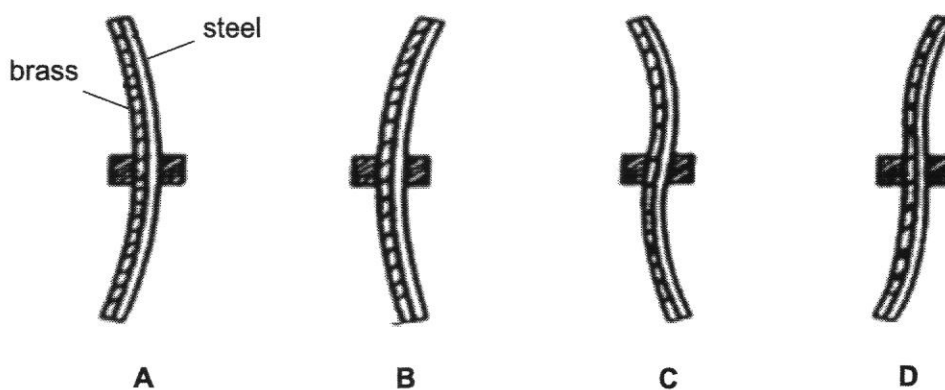


If thermal energy flows from X to Y and from Z to Y, what are the possible initial temperatures of X, Y and Z?

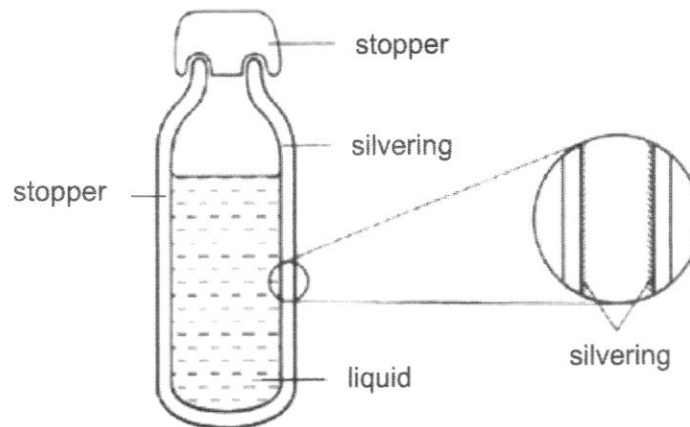
	X	Y	Z
A	50 °C	60 °C	70 °C
B	50 °C	70 °C	60 °C
C	60 °C	50 °C	70 °C
D	60 °C	70 °C	50 °C

- 8 A bimetallic strip is made up of brass and steel.

Which strip shows the correct outcome when the strip is cooled?



- 9 The diagram shows a vacuum flask and an enlarged view of a section through the flask wall.



Which of the following heat transfer process(es) is/are reduced by the silvering?

- A by conduction and convection
 - B by conduction only
 - C by radiation and convection
 - D by radiation only
- 10 Aluminium foils are often used to wrap the food that are to be barbecued. The aluminium foil has a shiny side and a dull side.

Which of the following correctly explains how it works?

- A The dull side should be on the inside because it is a better absorber of heat radiation.
 - B The dull side should be on the inside because it is a better conductor of heat.
 - 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 reflects the trapped heat radiation to the food.
- 11 Which of the following processes shows a chemical reaction taking place?
- A adding salt to water
 - B burning a piece of wood
 - C melting an ice cube
 - D mixing water with chalk powder

[Turn over

- 12 When magnesium is heated in air, it burns to form a white solid called magnesium oxide.

What type of chemical change has occurred?

- A combustion
- B electrolysis
- C neutralisation
- D thermal decomposition

- 13 Which of the statements are true when a chemical reaction occurs?

- I Atoms are destroyed so that new substances can be created.
- II The atoms in the reactants rearrange to form the products.
- III The total mass of the reactants is the same as the total mass of the products.
- IV The number of atoms before and after the reaction remains the same.

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

- 14 Which is **not** an example of a harmful effect of chemical changes?

- A burning of fossil fuels leading to air pollution
- B cellular respiration in all living cells
- C formation of acid rain
- D rusting of iron bridges

- 15 The table below gives information about three indicators.

indicator	colour of indicator at pH 1	pH at which colour changes	colour of indicator at pH 12
thymol blue	red	3	yellow
congo red	blue	5	red
phenolphthalein	colourless	10	red

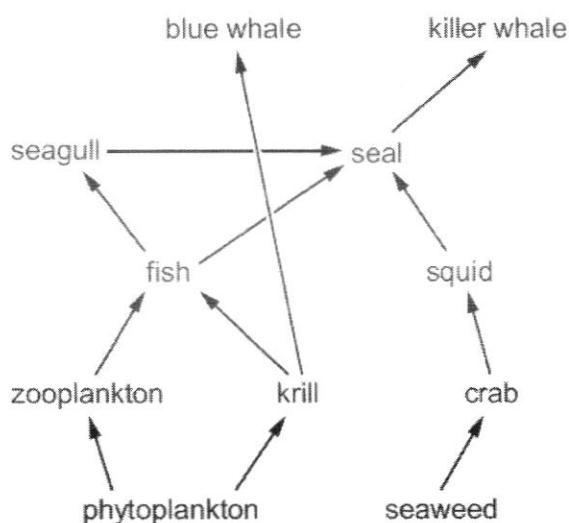
Which of the following correctly describes the colour of the indicator when added into a beaker of pure water?

	thymol blue	congo red	phenolphthalein
A	red	blue	red
B	yellow	blue	colourless
C	yellow	red	red
D	yellow	red	colourless

- 16 Which is an example of a population?
- A** all of the animal species in Africa
 - B** all of the herbivores in a forest
 - C** all of the animals and plants living in a lake
 - D** all of the pine trees growing in a forest
- 17 Which structural adaptation makes the tiger a good predator?
- A** rounded skull
 - B** sharp teeth
 - C** small ears
 - D** thick fur

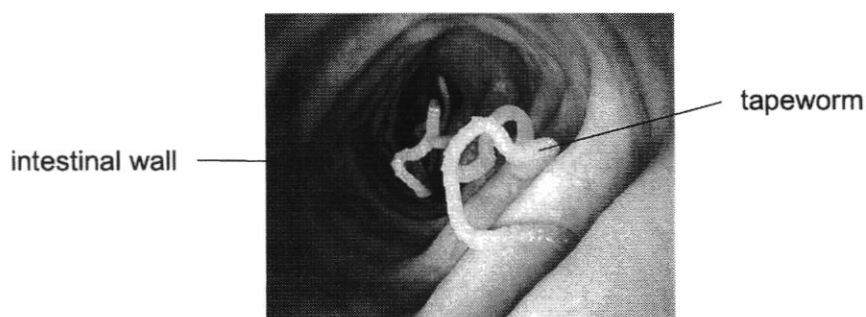
[Turn over

- 18 The diagram shows an aquatic food web.



Which statement is correct?

- A There are three producers and two primary consumers.
 - B There are two herbivores and two tertiary consumers.
 - C There are two primary consumers and two secondary consumers.
 - D There are two producers and three herbivores.
- 19 Tapeworms are flat, segmented worms that live in the intestines of some animals. The tapeworm head adheres to the intestinal wall, grows and produces eggs.



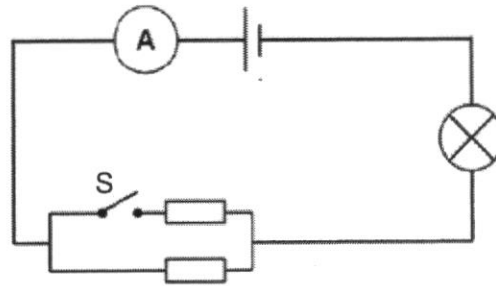
Which term describes the interrelationship between the tapeworms and its host?

- A feeding
- B mutualism
- C parasitism
- D predator-prey

20 Which is an example of sustainable use of resources?

- A allowing only young fish to be caught
- B controlling the number of fish caught
- C cutting down a forest and not replanting trees
- D planting deforested areas with similar species of plants

21 The circuit below consists of a battery, two identical resistors, a light bulb, an ammeter and a switch S.

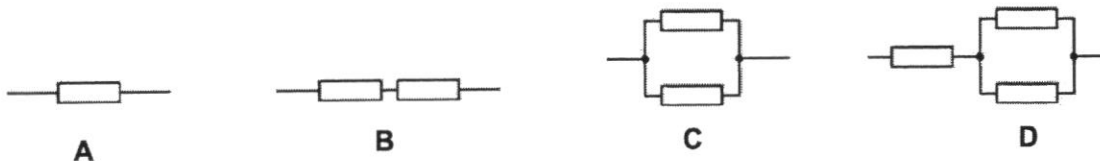


Which of the following shows the ammeter reading and brightness of the bulb after switch S is closed?

	ammeter reading	brightness of bulb
A	decrease	decrease
B	increase	increase
C	same as before	increase
D	same as before	same

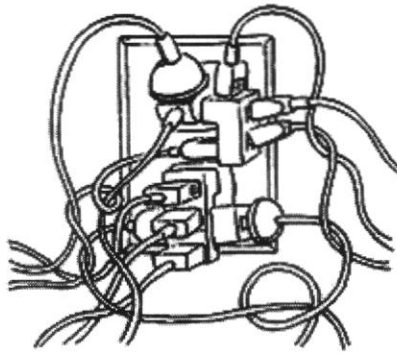
22 The diagrams show different ways of arranging identical resistors.

Which arrangement has the least resistance?



[Turn over

- 23 The diagram below shows a potential electrical hazard.



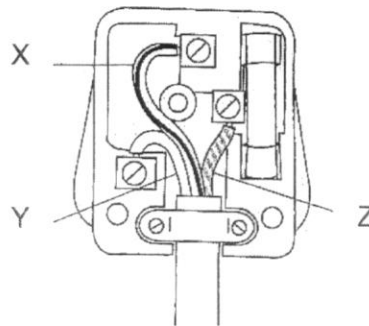
Which of the following statements best explains why it is a potential hazard?

- A The amount of electric current flowing to each appliance is reduced.
 - B The appliances that are plugged into the power socket may be damaged.
 - C The power socket may explode.
 - D Too much electric current is drawn causing overheating.
- 24 When a current of 6.0 A flows through a metallic conductor, the potential difference across it is 24 V.

What is the resistance of this conductor?

- A 0.25 Ω
- B 4.0 Ω
- C 30 Ω
- D 140 Ω

- 25 The diagram below shows a correctly wired-up three-pin plug with the cover removed.



What is the correct colour of each wire?

	X	Y	Z
A	blue	green and yellow	brown
B	blue	brown	green and yellow
C	brown	blue	green and yellow
D	green and yellow	blue	brown

- 26 In which parts of the digestive system are proteins being digested?

- I large intestine
- II mouth
- III small intestine
- IV stomach

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

- 27 Why is digestion important?

- A** Digestion breaks down food into simpler, smaller and soluble substances for absorption.
- B** Digestion helps us to swallow food more easily.
- C** Digestion increases the amount of nutrients in food.
- D** Digestion removes the taste and smell so that food can be absorbed more easily.

[Turn over

28 Which of the following is/are example(s) of physical digestion?

- I chewing food in the mouth
- II food pushed towards the stomach by the gullet muscles
- III protease breaking down protein

- A** I only
- B** I and III
- C** II only
- D** II and III

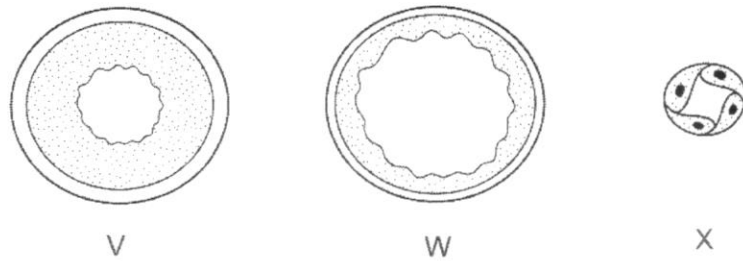
29 Which of the following is **not** true of bacteria?

- A** Bacteria are used to produce food items such as yoghurt and cheese.
- B** Bacterial infection can cause gastritis.
- C** Bacteria only causes harm to our digestive system.
- D** Food contaminated by bacteria can lead to diarrhoea or vomiting.

30 Which of the following does **not** prevent constipation?

- A** consuming less caffeine
- B** drinking more water
- C** eating food high in fibre
- D** having adequate exercise

- 31 The diagram shows cross-sections through three types of blood vessels, not drawn to scale.



What are V, W and X?

	V	W	X
A	artery	capillary	vein
B	artery	vein	capillary
C	vein	artery	capillary
D	vein	capillary	artery

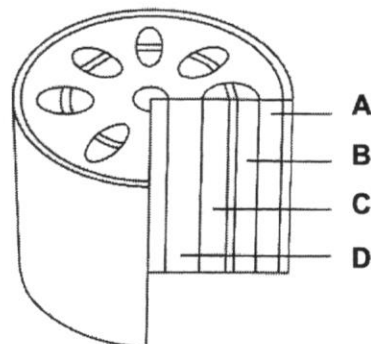
- 32 The diagrams show four components of blood.



Which component transports oxygen to different parts of the body?

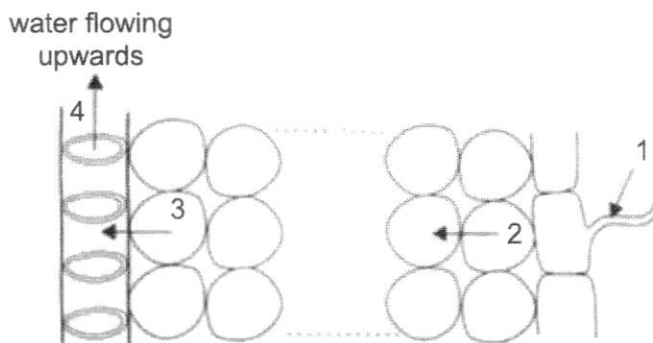
- 33 The diagram below shows a section of a plant stem which has been placed in red-coloured water for one day.

In which tissue would the red-coloured water be observed?



[Turn over

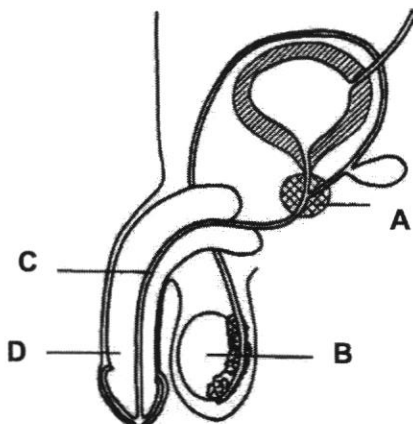
- 34 The diagram shows the pathway of water movement from the soil into the root until it reaches the upper part of a plant.



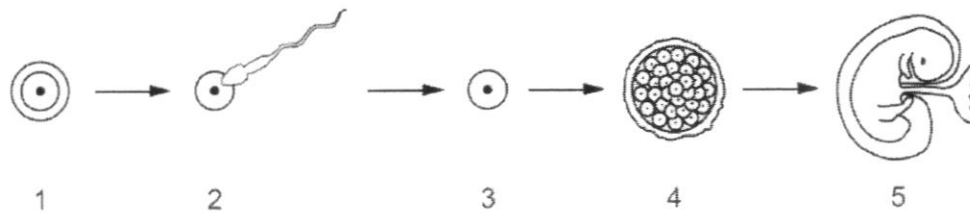
Which part(s) of the pathway involves osmosis?

- A 1 only
 - B 2 and 3 only
 - C 1, 2 and 3 only
 - D 1, 2, 3 and 4
- 35 What is the function of phloem?
- A transports minerals to the roots
 - B transports starch to the roots
 - C transports sugar to the roots
 - D transports water to the roots
- 36 The diagram shows part of the male reproductive system.

Where are sperms produced?



- 37** The diagram shows some of the stages in human reproduction, starting from the ovum and ending with foetus.



Where in the body does stage 2 take place?

- A** ovary
- B** oviduct
- C** vagina
- D** uterus
- 38** Which of the following changes only occur in females during puberty?
- A** growth of armpit hair
- B** hips becoming broader and wider
- C** spurts in growth
- D** voice becoming deeper
- 39** Which of the following is true of sexually transmitted infections?
- A** Sexually transmitted infections can only be transmitted through sexual intercourse with infected partners.
- B** Syphilis and gonorrhoea are caused by bacteria.
- C** There is no cure for all sexually transmitted infections.
- D** Transmission of sexually transmitted infections can be completely prevented by using condoms.

[Turn over

- 40** Which of the following is true of the effect of substance abuse on a foetus?
- A** Alcohol consumption and abuse of drugs can only lead to behavioural challenges in the child.
 - B** Babies may be born premature with low birth weight.
 - C** Babies may be born with yellow skin due to jaundice.
 - D** Smoking will only affect the development of the foetus' lungs.

END OF SECTION A



DAMAI SECONDARY SCHOOL

End-of-Year Examination 2022

CANDIDATE NAME

CLASS

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INDEX NUMBER

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SCIENCE

10 October 2022

Secondary 2 Express

2 hours

Setter: Ms Lenny Marlina

100 marks

ANSWER BOOKLET

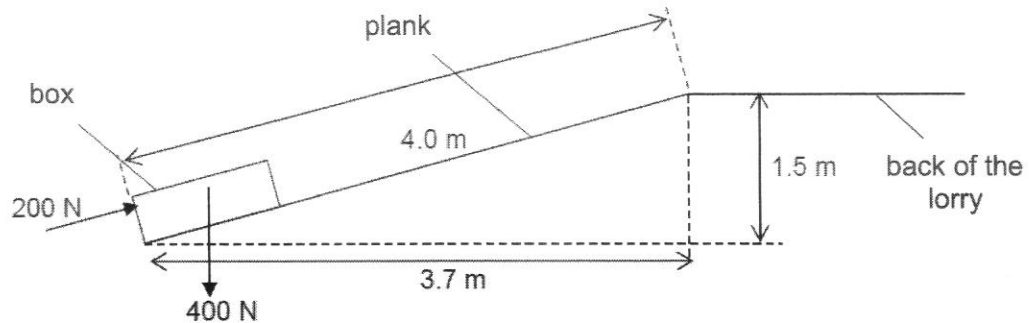
Section	Marks
A	/ 40
B	/ 60
Total	/ 100

[Turn over

Section B

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

- 1 A man push a box up a 4 m plank onto the back of his lorry which is 1.5 m high as shown in the diagram below.



- (a) State the energy conversion as the man pushes the box along the plank to a height above the ground.

..... energy → energy
 → energy [3]

- (b) (i) Calculate the work done by the man to push the box up the full length of the plank.

work done = J [2]

- (ii) Suggest why the work done by the man to push the box up the lorry is more than the total gravitational potential energy gained by the box.

.....
 [1]

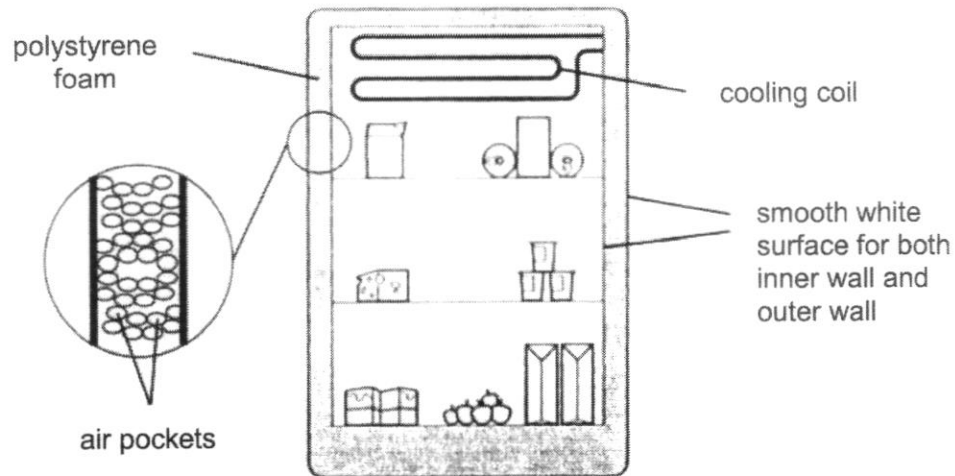
- (c) (i) Identify the contact force present between the box and the plank.

.....[1]

- (ii) Describe how this contact force can be reduced.

.....[1]

- 2 A small refrigerator is shown below. The refrigerator walls are made of smooth white metal with a layer of polystyrene foam between the inner and outer walls.



- (a) Explain why the surfaces of the outer wall are made smooth and white.

.....

[2]

- (b) With reference to the concept of heat transfer, explain why polystyrene foam is used between inner and outer walls.

.....

[2]

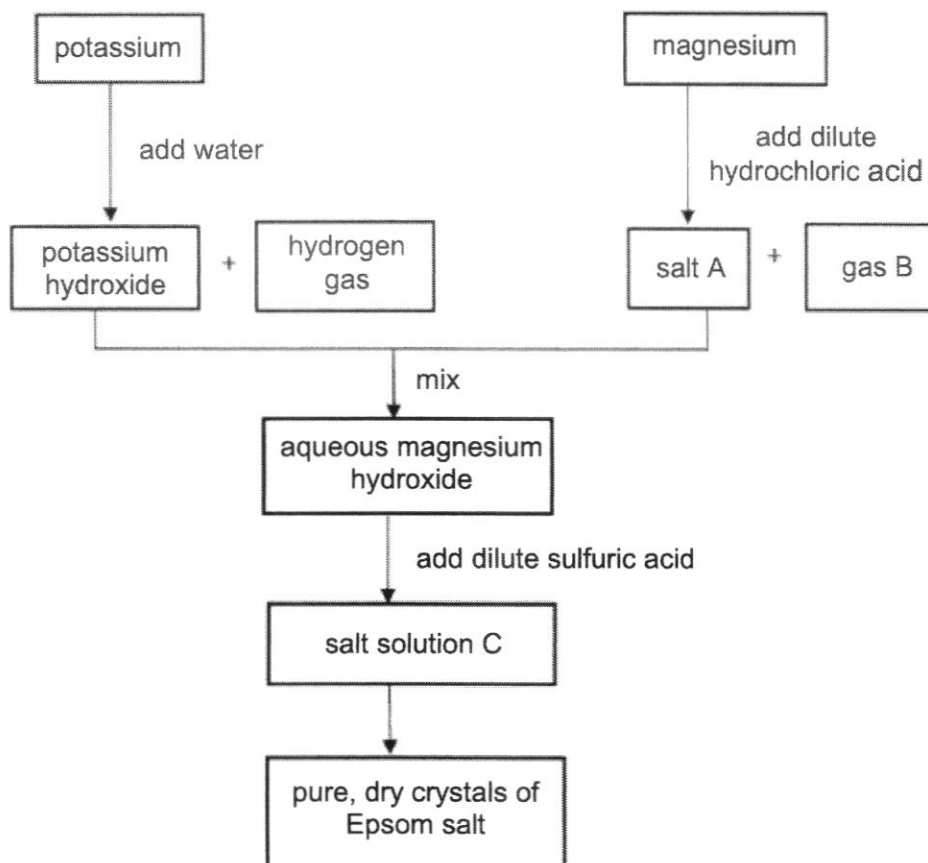
- (c) Explain how the inside of the refrigerator is eventually cooled.

.....

[3]

[Turn over

- 3 The flowchart below shows how Epsom salts are produced commercially. Epsom salts are often used in home treatments to help relax muscles and loosen stiff joints.



- (a) Identify the unknown substances, A, B and C.

A:

B:

C:

[3]

- (b) Describe a test and its observation to confirm the identity of gas B.

test:[1]

observation:

.....

.....[1]

- (c) (i) Name the chemical reaction between aqueous magnesium hydroxide and dilute sulfuric acid.

.....[1]

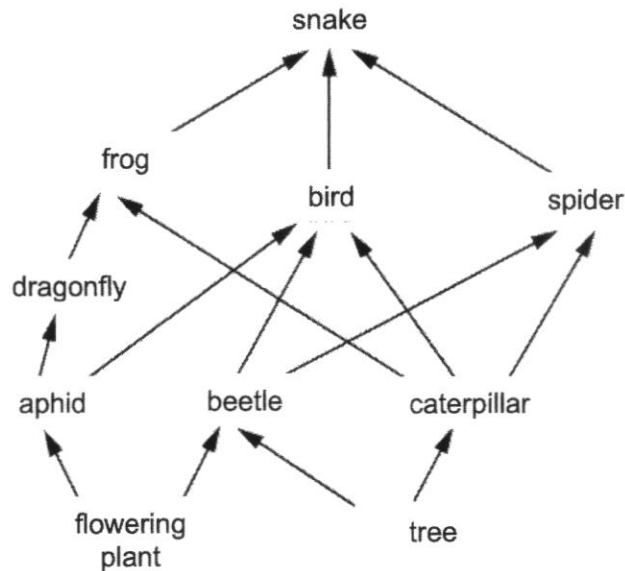
- (ii) State the expected pH of salt solution C and describe how to confirm its pH using known indicators.

pH of salt solution C:[1]

test:

..... [1]

- 4 The diagram below shows a food web.



- (a) State the ultimate source of energy for food webs.

.....[1]

- (b) (i) Identify the producer(s) from the food web.

.....[1]

- (ii) Explain the role of the producers within the ecosystem.

.....

.....

..... [2]

[Turn over

- (c) A disease killed most of the snakes in the food web.

Describe what happens to the population of each of the following organism.

Explain the reasons for it.

- (i) frogs

.....

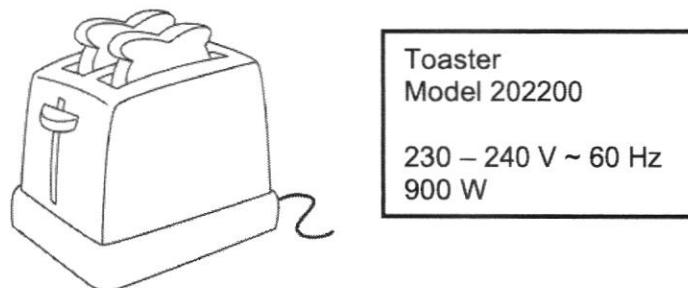
[2]

- (ii) caterpillars

.....

[2]

- 5 An electrical toaster has a power rating label printed on the bottom of the appliance as shown in the diagram below.



- (a) (i) Calculate the electrical energy consumption of the electric toaster if it was used for 1 hour a day for one week.

electrical consumption =kWh [2]

- (ii) Hence, calculate the cost of using the electric toaster for a week given that the electricity tariff is \$0.20 per kWh.

cost = \$..... [1]

- (b) The heating element of the electric toaster carried a current of 7.0 A when operated on the 240 V mains supply.

Mary bought a fuse with a rating of 5.0 A and used it for the mains plug for the electric toaster.

- (i) State the purpose of a fuse.

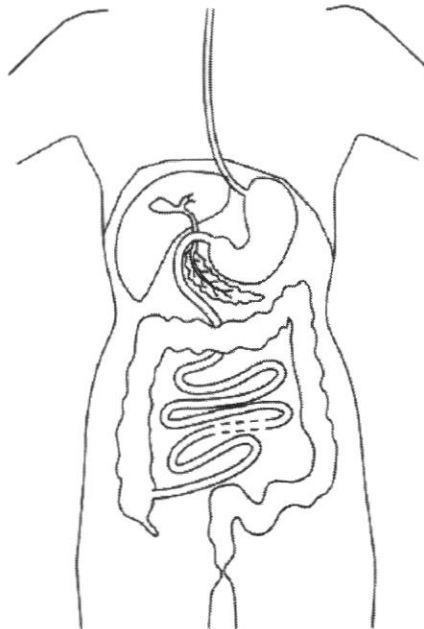
.....
[1]

- (ii) Suggest what happened to the 5.0 A fuse when it was used.

.....

[3]

- 6 The diagram below shows part of the human digestive system and its associated organs.



- (a) On the diagram, draw label lines with letters to show,

P - where gastric juice is released

Q - where all carbohydrates, fats and proteins are completely digested

R - where some water and mineral salts are absorbed from

[3]

[Turn over

- (b) A student investigated the digestion of fats by an enzyme from structure Q. He found that as the fats were digested, the pH of the solution changed from pH 8 to pH 6.

Explain why the digestion of fats changed the pH of the solution.

.....

[2]

- (c) Patients with diabetes are unable to produce a protein, insulin, to regulate their blood glucose concentration.

- (i) Describe how the level of blood glucose in diabetic patients differ from that of normal healthy individuals.

.....[1]

- (ii) Suggest one way how the risk of diabetes can be reduced.

.....
[1]

7 Substances in living things move around the organisms by diffusion and osmosis.

- (a) State one similarity and one difference between diffusion and osmosis.

similarity:
 [1]

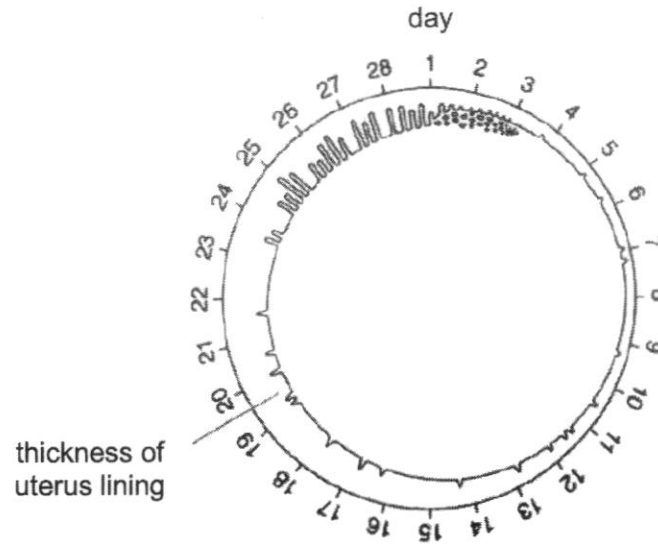
difference:
 [1]

- (b) Explain how mineral salts from the soil are taken in by the root cells of a plant and ultimately reach the xylem.

.....

[3]

- 8 The diagram shows how the thickness of the uterus lining changes during a menstrual cycle.



- (a) Explain what is meant by menstruation.

.....

[2]

- (b) (i) Describe what happens on day 14 of the menstrual cycle.

.....
[1]

- (ii) Describe what happens from days 20 to 28 of the menstrual cycle.

.....

[2]

- (c) (i) On the diagram, circle the days which fall within the fertile period. [1]

[Turn over

- (ii) A married couple is not ready to have children and would like to prevent a pregnancy from occurring.

State one example of a temporary birth control method that can be utilised by each gender and explain how it prevents pregnancy.

	example of temporary birth control method	how it prevents pregnancy
for males		
for females		

[4]

END OF SECTION B**END OF PAPER**

Sec 2E EOY EXAM 2022 MARKING SCHEME**SECTION A**

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

SECTION B

<u>Marker's comments:</u>			
□ Students generally did well for parts (a), (b) and (c) i). □ For (c) ii) – students seem to be confuse between idea of forces and energy. These 2 terms are not interchangeable. Eg. a moving object does not have force but it can have kinetic energy.			
1	(a)	Chemical potential energy → kinetic energy → gravitational potential energy	A1 each
	(b)	(i) Work done = force x distance = 200 N x 4 m = <u>800 J</u>	A1 A1
		(ii) Some of the energy transferred is lost as heat (due to friction between box and plank).	A1
	(c)	(i) Friction / frictional force	A1
		(ii) how friction can be reduced: • place wheels under the box Accept: use trolley; add ball bearings/ rollers under the box	A1

		Reject: add lubricant; add oil; make the plank smooth (these suggestions will not allow a person to push the box up the ramp safely and effectively.)	
<u>Marker's comments:</u> - Question 2 (a) showed distinction between students of higher and lower readiness with the former group highlighting the idea of poor absorber of infrared radiation specifically instead of heat. Some students stated the idea of being both "poor emitter and absorber" of infrared radiation/heat without understanding that only one of them applies in this case. Some others had the misconception that the outer wall was smooth and white as it is a "poor conductor of heat". - When it is about radiation, need to mention "infrared radiation" or "radiant heat". - For 2 (b), some students incorrectly stated that polystyrene foam is a poor conductor of heat without mentioning the presence of air pockets being the key factor. 2 (c) was generally well written and showed understanding of the relationship between ideas of cooling/losing heat and density. Some students had the misconception that the process/cycle was convection rather than a convection current being set up.			
2	(a)	- Smooth and white surface is a poor absorber of infrared radiation. - This reduces the infrared radiation absorbed by the refrigerator from the surrounding, thus lowering the interior temperature of the fridge. Accept: poor absorber of radiant heat; to reflect infra-red radiation Reject: poor/bad conductors of infra-red radiation/ heat; poor absorbers of heat (need to mention either <u>infra-red radiation</u> or <u>radiant</u> heat to distinguish absorbent of heat transferred by other processes)	A1 A1
	(b)	- Polystyrene foam contains many air pockets and air is a poor conductor of heat. - This reduces heat gained by the refrigerator through conduction Reject: polystyrene foam is a poor conductor of heat	A1 A1
	(c)	How cool air circulates around refrigerator: - The air near the cooling coil/at the top cools and <u>contracts</u>, causing its <u>density to increase</u> and <u>sinks to the bottom</u>. - The warmer air at the bottom, which is <u>less dense</u>, <u>risers to the top</u> and get cooled - This cycle of sinking and rising repeats and set up the convection current in the air which cools the refrigerator.	A1 A1 A1

Marker's comments:

- Overall Question 3 was generally well done with students being able to answer most of the questions correctly.
- Question 3 (b) was generally well written with students understanding the test for hydrogen gas. However, to highlight the need to state "lighted splint" instead of simply stating lighting a wooden splint. This is to emphasize idea of a lighted splint to differentiate test for hydrogen gas to oxygen gas (which is to use a glowing splint but also need a wooden splint to be lighted up first.)
- For 3 (c) i), some students misread the question and stated the equation instead of the name.

3	(a)	A: magnesium chloride B: hydrogen gas C: magnesium sulfate and water Accept: aqueous magnesium sulfate for C	
	(b)	Test: <u>insert a lighted splint</u> Accept: lighted splint test Reject: simply stating "lighted splint"; light a wooden splint (this could lead to either a lighted splint or glowing splint, a test for oxygen gas) Observations: <u>Lighted splint extinguished with a 'pop' sound</u>	A1 A1
	(c)	(i) neutralisation	A1
		(ii) pH of salt solution C: pH 7 test (any one): - Add a few drops of Universal indicator + turns green - Use moist blue <u>and</u> red litmus papers + <u>both</u> remain blue and red respectively Reject – if observation of only one litmus is stated eg. red litmus remains red	A1 A1

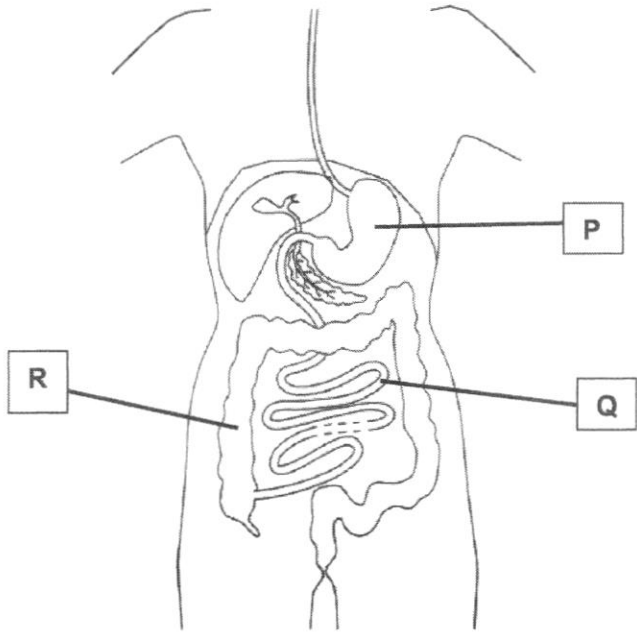
Marker's comments:

- For 4 (b) ii), generally not well written. Common incorrect answers was that producers produce/ provide food for primary consumers/ herbivores/ consumers (without mention of the importance of the food containing the energy) or that the energy is transferred to primary consumers without mention of energy transfer to other consumers down the food chain.
- For 4 (c), generally students understood and able to articulate the link between decrease in population of predators and increase in population of their prey and vice versa. Some students have the misconception that there were no snakes when it was mentioned that most and not all snakes were killed.

4	(a)	Sun / sunlight/ light energy (from the sun) Accept: solar energy	A1
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	(b)	(i) producers – flowering plant + tree	A1
		(ii) Role of producers: • Absorbs sunlight to be used in photosynthesis to produce food • Food produced stores chemical potential energy which is transferred to consumers in the food chain Accept: gets energy from sun to produce food; help provide primary consumers with food with energy in it and transfers energy when secondary consumer consumes it; provide energy to consumers; to convert light energy from the sun to chemical energy that can be food for other organisms; provide energy to the food web. Reject: provide food for primary consumers	A1 A1
	(c)	(i) frogs: • population of frogs increases • less predation by snakes/ less being fed on by snakes Reject: snakes “hunt” frogs	
		(ii) caterpillars • population of caterpillars decreases • population of frogs, birds and spiders increases, which means that there will be a greater number of predators feeding on caterpillars; more competition for food from increased population of frogs and other predators, birds and spiders Reject: if stated “there is no more predators preying on it” (or ideas indicating extinction of a species)	A1 A1
Marker's comments: ○ Students generally did well for 5 (a). ○ For 5 (b), there was quite a repetition of answers between parts (i) and (ii) suggesting that students were unsure in differentiating purpose/function and how the component works. Some students had the misconception that fuses will “blow up” or “explode”.			
5	(a)	(i) Power used = $900 \text{ W} / 1000 = 0.9 \text{ kW}$ In one week = $0.9 \text{ kW} \times 7 \text{ h}$ = <u>6.3 kWh</u>	A1 A1
		(ii) cost = $6.3 \text{ kWh} \times \$0.20 = \1.26 [allow for ECF]	A1
	(b)	(i) Purpose of fuse: • to protect electrical appliance from excess current	A1

	Accept: prevent appliances from overheating due to excessive flow of current; protects appliance when there is too much current flowing (students should not be explaining how the fuse works in this part.) Reject: to prevent electrical fire (without mentioning idea of overheating happening first); fuse melts and opens the circuit; to melt and open the circuit to prevent electrical fire when current exceeds fuse rating; to prevent electrical shock; stops flow of electric current when amount of current exceeds current rating; prevents overheating of appliances (without mentioning when current exceeds current rating)	
	(ii) What happened to 5.0 A fuse: • current that flows through appliance is larger than fuse rating • this causes the thin wire inside the fuse to <u>overheat</u> and <u>melt</u> • circuit becomes open + no current is able to flow through Accept: fuse will melt Reject: fuse will blow out	A1 A1 A1
<u>Marker's comments:</u> ○ Question 6 (b) showed distinction between students who have stronger conceptual knowledge than others. Some students had the incorrect idea that enzymes/ lipases are acidic and the fats are alkaline, suggesting lack of understanding that the digestive juices are the ones that created the alkaline or acidic environment and not specifically enzymes. Some also incorrectly thought that fats are digested in the stomach.		

6	(a)		A1 each
	(b)	- fats digested to fatty acids and glycerol - Presence of fatty acids reduces the pH Accept: end products of digestion of fats contain more acids	A1 A1
	(c)	(i) higher level of blood glucose	A1
		(ii) How to reduce risk of diabetes (any one): - Avoid smoking and drinking alcohol - Have a balanced and healthy diet - Avoid consuming food that are high in salt, sugar and saturated fats - Exercise regularly Accept: cut down consumption of carbohydrates Reject: do more exercises (not about doing more but rather to do it regularly); control sugar intake (without mentioning how ie. more or less sugar?); eat lesser food containing high amounts of sugar (diabetics should not even consume any food with high amounts of sugar); ingest less sugar (sugar can be found in other types of food and cutting down on sugar sweetener itself may not be a good way)	A1
Marker's comments: Question 7 was generally well written by students who have stronger content knowledge. Some students incorrectly assumed that movement of mineral salts was by osmosis even though they have correctly described the entire movement to the xylem.			
7	(a)	similarity: Both involves movement of substances down concentration / water potential gradient;	A1

		movement from a region of a higher concentration to a region of a lower concentration Reject: movement from a higher region to a lower region difference: osmosis involves water molecules and a partially permeable membrane but diffusion do not. Accept: diffusion involves movement of all types of molecules but osmosis involves movement of water molecules only.	A1
	(b)	Movement of mineral salts: - there is a higher concentration of mineral salts in the soil than in the root cells. - mineral salts diffuses into the root cells down concentration gradient - continues to do so until it reaches the xylem	A1 A1 A1
Marker's comments: - Question 8 (a) was well written by students who have memorized definitions. Some got confused with the ideas of menstruation and ovulation or had the misconception that an ovum was released during menstruation. - Students generally were able to state a type of temporary birth control method for 8 (c) but some had misconception on how the birth control works or stated the incorrect parts of the female reproductive system in which the birth control eg. diaphragm would be placed.			
8	(a)	Menstruation: - lining of uterus and blood vessels break down - discharged through the vagina with the unfertilized egg Accept: inner lining of uterus breaks down Reject: breakdown of uterus; shedding of uterine lining; breaking down of uterus lining and release of a mature egg; discharge of ovum, uterine lining and waste in the uterus; discharge of ovum and uterine lining (without mentioning idea of dead ovum and that the uterine lining was broken down).	A1 A1
	(b)	(i) one ovary releases an egg into the oviduct [reject – ovulation] Accept: egg released from one of the ovary Reject: ova released from ovary	A1

	(ii) days 20 – 28: • lining of uterus continues to thicken • if there is no fertilization, lining will break down Accept: uterus lining thickens; maintains its thickness; uterine lining is the thickest	A1 A1									
(c)	(i) circle days 11 – 17 [accept – days 10 – 15]	A1									
	(ii) Any one appropriate example for each gender + correct explanation <table border="1"> <thead> <tr> <th></th><th>example of temporary birth control method</th><th>how it prevents pregnancy</th></tr> </thead> <tbody> <tr> <td>for males</td><td> • condom • spermicide </td><td> • Prevents sperm from being deposited in vagina and entering the uterus • kills sperm in the vagina </td></tr> <tr> <td>for females</td><td> • birth control pills • intra-uterine device • diaphragm Accept: ○ rhythm method ○ spermicide </td><td> • disrupt release of eggs from ovaries and prevent fertilization; • prevents ovulation; release of ovum from ovary • prevents embryo from being implanted into uterus • prevents sperms from entering the uterus through cervix • avoid sexual intercourse during the days within fertile period • to kill sperms in the vagina </td></tr> </tbody> </table> Reject: Condom – blocks sperms from meeting ovum (without specifying exactly how this happens); prevents semen to fuse with ovum; by preventing sperms from reaching ovum Spermicide – to kill sperms (without mentioning where this would happen) Birth control pills – prevents fertilization; stops ovaries from producing eggs		example of temporary birth control method	how it prevents pregnancy	for males	• condom • spermicide	• Prevents sperm from being deposited in vagina and entering the uterus • kills sperm in the vagina	for females	• birth control pills • intra-uterine device • diaphragm Accept: ○ rhythm method ○ spermicide	• disrupt release of eggs from ovaries and prevent fertilization; • prevents ovulation; release of ovum from ovary • prevents embryo from being implanted into uterus • prevents sperms from entering the uterus through cervix • avoid sexual intercourse during the days within fertile period • to kill sperms in the vagina	A2 A2
	example of temporary birth control method	how it prevents pregnancy									
for males	• condom • spermicide	• Prevents sperm from being deposited in vagina and entering the uterus • kills sperm in the vagina									
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		Diaphragm – by not allowing sperms to enter the vagina (diaphragm is placed within the cervix so semen is still able to enter the vagina region)	
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END OF MARKING SCHEME