Anglo-Chinese School (Barker Road)

END-OF-YEAR EXAMINATION 2021

SECONDARY TWO EXPRESS

SCIENCE

Duration: 2 hours

SECTION A

INSTRUCTIONS TO CANDIDATES:

The use of an approved scientific calculator is expected, where appropriate.
Do not use glue or correction tape or fluid.

Section A

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 OTAS answer sheet.

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.

This question paper consists of 10 printed pages.

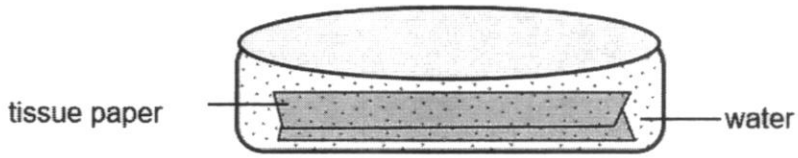
SECTION A (30 marks)

Select the best answer and shade it in the OTAS provided.

A1 Which development shows an example of the abuse of scientific applications?

A The development of biodegradable products.
B The development of new source of energy.
C The development of organic food.
D The development of pure samples of heroin for consumption.

A2 Joseph wants to compare the amount of water absorbed by two brands of tissue paper. The experiment set-up is shown in the figure below.



Which of the variables are classified correctly?

	dependent variable	independent variable
A	brand of tissue paper	amount of water absorbed
B	amount of water absorbed	brand of tissue paper
C	amount of water used for the experiment	brand of tissue paper
D	brand of tissue paper	amount of water used for the experiment

A3 Which method is **not** used for separating substances physically?

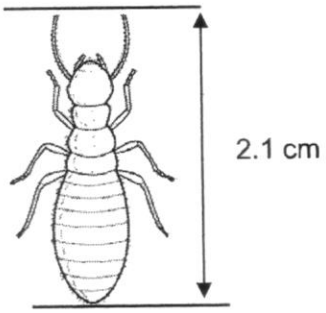
A chromatography
B electrolysis
C evaporation
D magnetic separation

A4 Compound X is formed when elements S and T are mixed and heated in a test tube.

Which statement about compound X is **incorrect**?

A Compound X has properties that are different from elements S and T.
B Compound X is made up of two elements.
C Elements S and T can be obtained from compound X by physical means.
D The proportion by mass of elements S and T in compound X is fixed.

A5 The diagram shows the drawing of an ant.



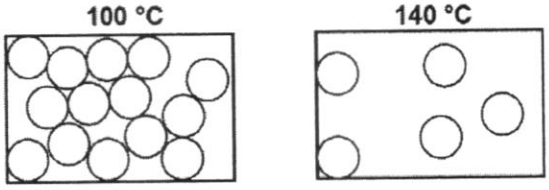
What is the magnification if the actual length of the ant is 0.6 cm?

A 0.2 x
B 1.3 x
C 3.5 x
D 5.0 x

A6 Which statement about an atom is **true**?

A An atom always has equal numbers of electrons and neutrons.
B The nucleus of an atom always contains protons and neutrons.
C The nucleus of an atom is electrically neutral.
D The mass of an atom is concentrated in its nucleus.

A7 The diagram below shows the arrangement of particles in a substance at 100 °C and 140 °C.



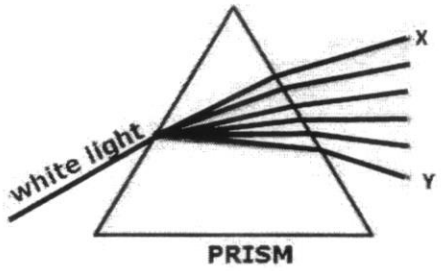
What could be the melting point and boiling point of the substance shown?

	melting point / °C	boiling point / °C
A	-120	-80
B	-20	40
C	40	125
D	120	180

A8 A boy is standing 2.0 m in front of a mirror. His cat is sitting 3.0 m behind him. If the cat walks 1.5 m towards the mirror, how far is the boy away from the cat's image in the mirror?

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

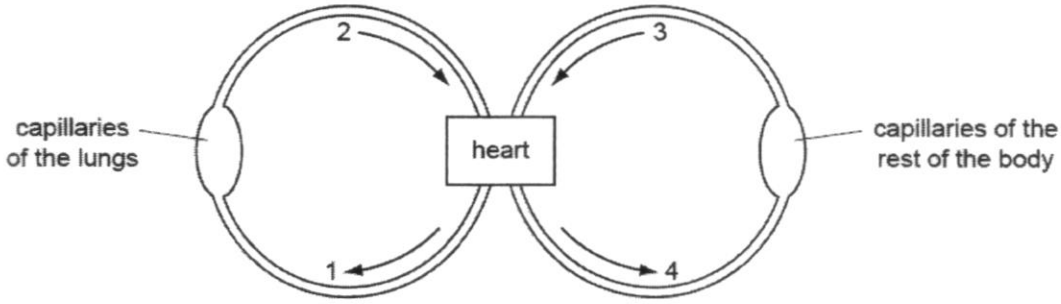
A9 The diagram shows a ray of light entering a glass prism.



What is the colour observed at **X** and **Y** respectively?

	colour at **X**	colour at **Y**
A	red	violet
B	red	red
C	violet	red
D	violet	violet

A10 The diagram shows the human circulatory system.

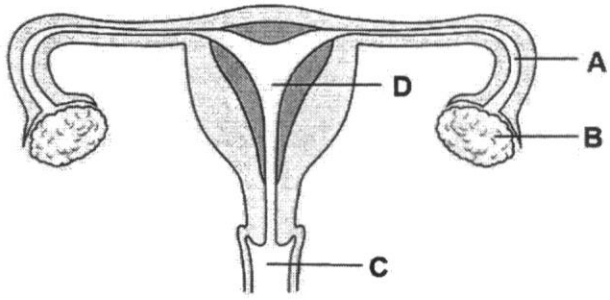


Which two vessels carry oxygenated blood?

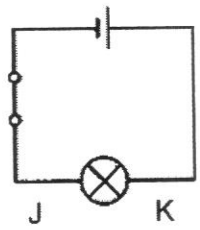
A 1 and 2
B 1 and 4
C 2 and 3
D 2 and 4

A11 The diagram shows the female reproductive system.

Where does fertilisation occur?



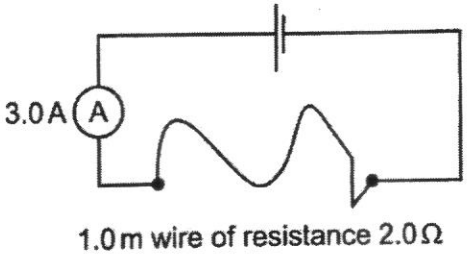
A12 An electrical circuit is set up as shown.



What are the directions of the electron flow and conventional current flow through the bulb?

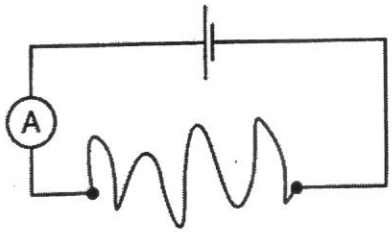
	direction of the electron flow	direction of the conventional current flow
A	J to K	J to K
B	J to K	K to J
C	K to J	J to K
D	K to J	K to J

A13 Circuit I shows a wire of length 1.0 m which has a resistance of 2.0 Ω. When connected to a dry cell, the current in the wire is 3.0 A.



Circuit I

Circuit II shows a 2.0 m length of the same wire which is connected to the same dry cell.



Circuit II

Which row correctly describes the readings of the resistance and current?

	resistance / Ω	current / A
A	$R_2 > 2.0$	$A_2 > 3.0$
B	$R_2 > 2.0$	$A_2 < 3.0$
C	$R_2 < 2.0$	$A_2 > 3.0$
D	$R_2 = 2.0$	$A_2 = 3.0$

A14 Kristine is participating in a 16 km race. There are 2 compulsory hydration stations (each lasting at least 2 minutes) along the track where all runners must stop to have a quick drink.

If Kristine is running at an average speed of 12 km/h, what is the minimum time that she would take to complete this race?

A 45 min
B 49 min
C 1 h 20 min
D 1 h 24 min

A15 Which action does **not** involve a contact force?

A a needle in a compass pointing north
B hitting a baseball
C sweeping the floor
D turning the steering wheel of a car

A16 What is the S.I. unit for work?

A Joule
B Pascal
C Newton
D Watt

A17 Which energy sources and their uses are correctly matched?

	energy sources	uses
A	biofuels geothermal energy	to generate electricity used for heating
B	geothermal energy solar energy	to power vehicles to generate electricity
C	fossil fuels hydroelectric energy	to generate electricity used for heating
D	hydroelectric energy wind energy	to power vehicles to generate electricity

A18 Some energy sources and their impacts are listed.

1 Biofuels – plays a part in global warming
2 Geothermal energy – may cause sink holes
3 Hydroelectric energy – may cause extensive flooding
4 Solar energy – no pollutants released
5 Wind energy – produces ultrasound

Which of the impacts are correctly listed?

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

A19 Which statement describes sound waves?

A The particles vibrate in circular motions in a medium.
B The particles vibrate randomly in a medium.
C The particles vibrate to and fro along the axis in a medium.
D The particles vibrate up and down along the axis in a medium.

A20 How does sound waves travel in the human ear?

A cochlea → ear canal → ear drum
B cochlea → ear drum → ear canal
C ear canal → ear drum → cochlea
D ear drum → ear canal → cochlea

A21 Which row correctly describes the type of signals passed on from the part of the ear?

	part of ear	type of signal
A	cochlea	electrical impulses
B	ear bones	electrical impulses and vibrations
C	ear drum	chemical
D	ear nerve	vibrations

A22 Which measure **does not** counter expansion of materials during hot weather?

A bends in pipes
B electrical cables hanging loosely
C gaps between tiles
D rollers under girder bridges

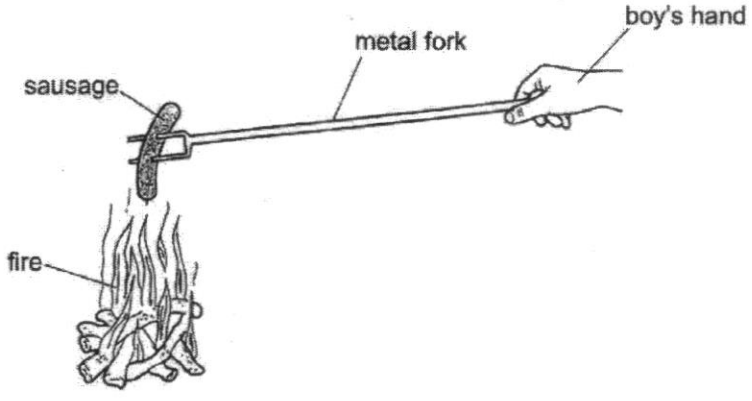
A23 Which shows the temperature in S.I. units of boiling water?

A 100 °C
B 100 °K
C 212 °F
D 373 K

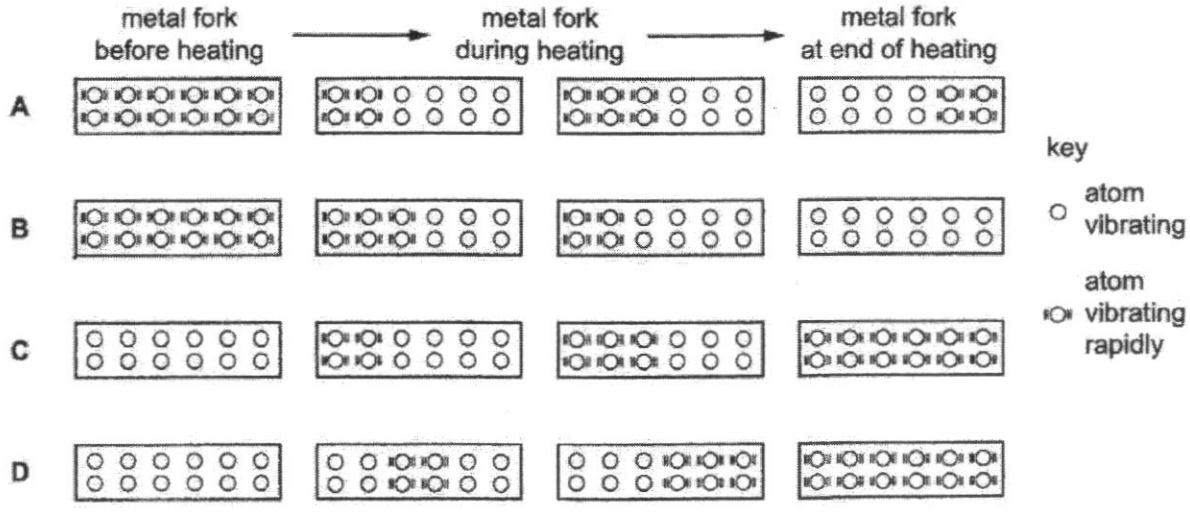
A24 Which part of the thermos flask reduces heat transfer by radiation?

A cap
B matt black plastic wall
C shiny interior wall
D vacuum wall

A25 The diagram shows a boy cooking a sausage on a metal fork. He holds the sausage and the fork in a fire.



Which set of diagrams represents how heat is conducted to the boy's hand?

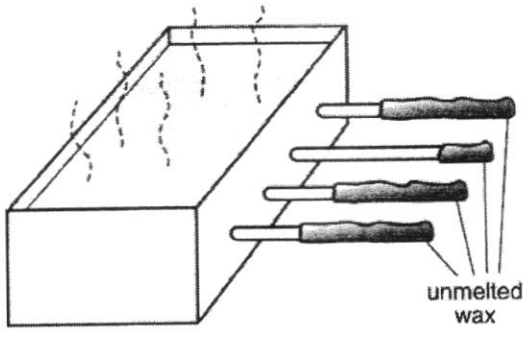


A26 A container of liquid nitrogen has a temperature of –196 °C. A fully inflated balloon is placed in liquid nitrogen for 5 s. The balloon appears deflated when taken out from liquid nitrogen, but begins to expand after a few seconds. After about 2 min, the balloon becomes fully inflated.

Which statement provides an explanation for the observation?

A Air contracts in liquid nitrogen to cause it to deflate, but as temperature increases, air expands to cause it to inflate.
B Air escapes from the balloon to cause it to deflate and enters the balloon to cause it to inflate.
C Liquid nitrogen enters the balloon and push out the air, deflating it, then evaporates to inflate the balloon.
D Nitrogen enters the balloon and pushes out the air, deflating it, then air enters the balloon and pushes out nitrogen to cause it to inflate.

A27 Four rods, each made of a different material (copper, glass, plastic and wood) are coated with wax and attached to the side of a hot water tank as shown.



After a while, which rod has the shortest length of unmelted wax?

A the copper rod
B the glass rod
C the plastic rod
D the wooden rod

A28 Which describes a positive test to show that an acid has reacted with a metal in a test-tube?

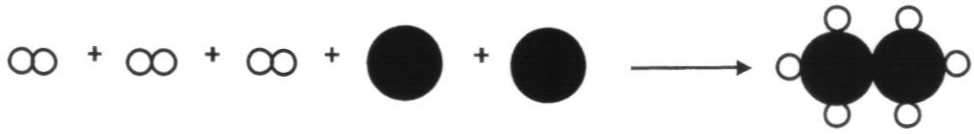
A a blue solution is obtained when the gas evolved is passed into Universal Indicator solution
B a burning splint is extinguished with a 'pop' sound by the gas evolved
C a white precipitate is obtained when the gas evolved is passed through lime water
D lime water remains colourless when the gas evolved is passed through lime water

A29 Which model shows a correct chemical reaction?

A 

B 

C 

D 

A30 One carbon atom, C, will react with 2 molecules of chlorine, Cl_2, to form one molecule of tetrachloromethane, CCl_4. Thus, 12 g of carbon will react with 142 g of chlorine gas.

What will be the mass of tetrachloromethane, CCl_4, obtained after this reaction is completed?

A 152 g
B 154 g
C 296 g
D 308 g

END OF SECTION A

Name:	Class:	Index No.:

Anglo-Chinese School (Barker Road)

END-OF-YEAR EXAMINATION 2021

SECONDARY TWO EXPRESS

SCIENCE

SECTION B & C

INSTRUCTIONS TO CANDIDATES:

Write your name, class and index numbers in the space provided at the top of this page.
Write in dark blue or black pen.
You may use a pencil for any graphs.
The use of an approved scientific calculator is expected, where appropriate.
Do not use glue or correction tape or fluid.

Section B and **C**
Answer all questions in the spaces provided.

INFORMATION FOR CANDIDATES:
The number of marks is given in brackets [ ] at the end of each question or part question.

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

*This question paper consists of **17** printed pages*

SECTION B (40 marks)

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

B1 Fig. 1 shows an experiment on movement of substances.

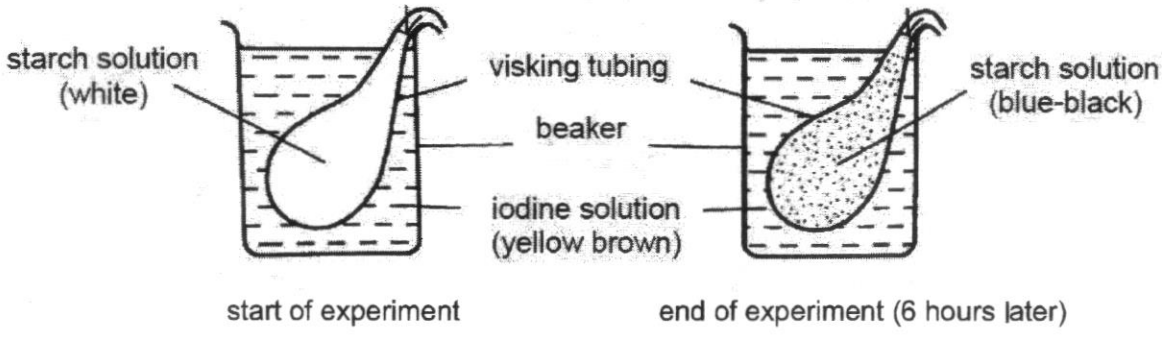


Fig. 1

At the start of the experiment, the visking tubing was filled with starch solution and placed into a beaker of iodine solution. It is known that when starch comes into contact with iodine, the colour of the starch solution changes from white to blue-black.

(a) Using the knowledge of movement of substances, explain why the starch solution changed colour after 6 hours.

.....

.....

.....

.....

.....[3]

(b) State the property of the visking tubing which caused the results demonstrated in **(a)**.

.....[1]

(c) Suggest why the iodine solution in the beaker remains yellowish brown after 6 hours.

.....

.....[1]

[Total: 5]

B2 Fig. 2 shows a male reproductive system.

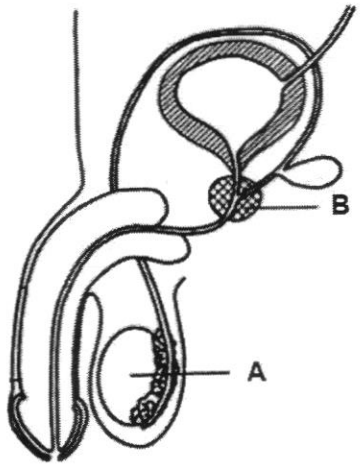


Fig. 2

(a) State the function of the parts labelled **A** and **B** in the male reproductive system.

A: .....

.....

B: .....

.....[2]

(b) Name the permanent birth control method for males.

.....[1]

(c) On Fig. 2, mark with an '**X**' the part of the male reproductive system that is affected by the method stated in **(b)**. [1]

[Total: 4]

B3 Fig. 3 shows the presence of large, complex nutrients in a food sample as the food passes along the alimentary canal. The width of the dark strip shows the amount of large complex nutrients present in the respective organs.

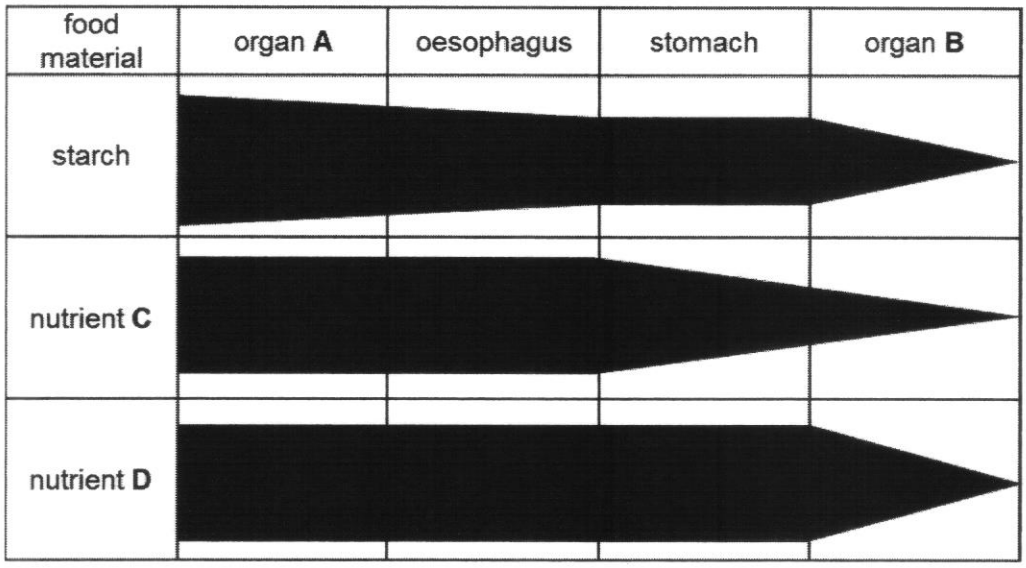


Fig. 3

(a) Identify organs **A** and **B**.

organ **A**: .....

organ **B**: .....[2]

(b) Using the information given in the figure, identify nutrients **C** and **D**.

nutrient **C**: .....

nutrient **D**: .....[2]

(c) State two main sources of nutrient **C**.

1. .....

2. .....[1]

(d) Suggest why the amount of starch decreases in the oesophagus even though no enzymes are produced there.

.....

.....

.....[2]

[Total: 7]

B4 **(a)** Fig. 4.1 shows an experiment to measure the frictional force between an object and the surface of a floor.

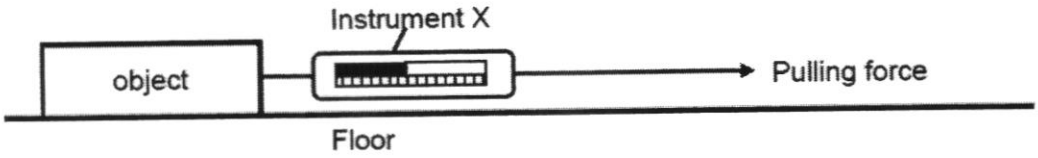


Fig. 4.1

(i) State the name of instrument **X**.

.....[1]

(ii) On Fig. 4.1, draw the frictional force acting on the object. [1]

(b) Fig. 4.2 shows a stool. Each leg of the stool has a square base of side 5 cm.

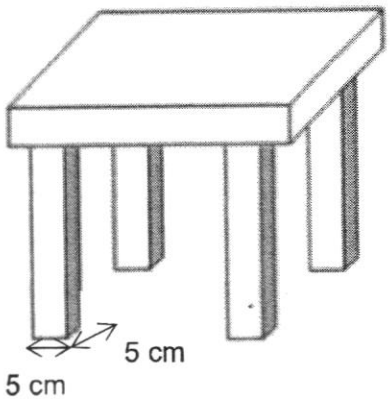


Fig. 4.2

The weight of the stool is 50 N.

Calculate the pressure exerted on the floor by the stool when a lady of weight of 500 N sat on the stool.

Pressure = ... N/cm^2 [2]

[Total: 4]

B5 Fig. 5.1 shows a fishing boat using sounding equipment to detect shoals of fish below the boat.

Pulses of sound waves are sent out from the boat and the shoals of fish reflect the sound.

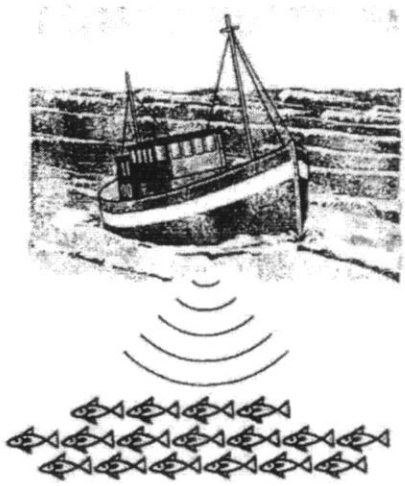


Fig. 5.1

The equipment picks up a reflection of sound from a shoal of fish 0.1 s after it leaves the boat.

(a) Name the term given to the reflection of sound.

.....[1]

(b) Sound waves travel through water at a speed of 1500 m/s.

Calculate the distance of the shoal of fish below the boat.

distance = ... m [2]

(c) A similar experiment was carried out on land to detect a herd of cattle grazing on a grassland. If the herd of cattle is at the same distance away as in **(b)**, predict how the detection of the reflection of sound will be affected.

.....[1]

(d) Explain your answer to **(c)**.

.....

.....[1]

(e) Fig. 5.2 shows traces of two different sound waves, **S1** and **S2**, drawn to the same scale.

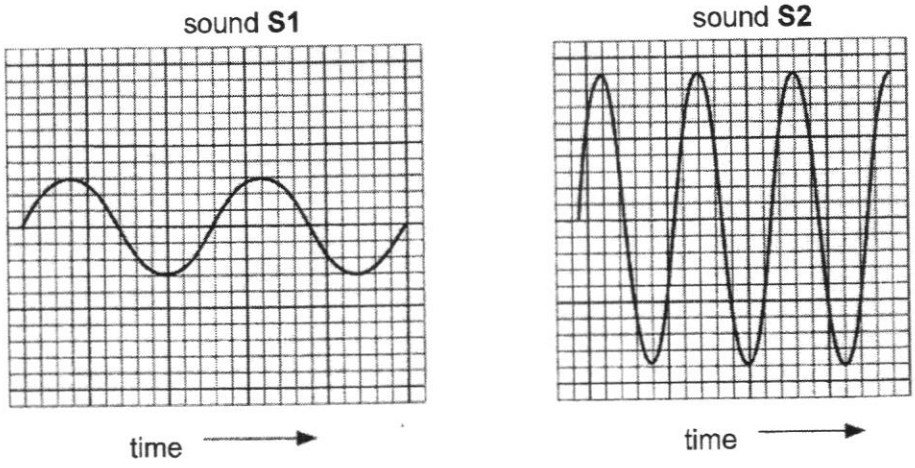


Fig. 5.2

State and explain how the loudness and the pitch of the sound has changed from **S1** to **S2**.

loudness: .....

.....

pitch: .....

.....[2]

[Total: 7]

B6 Fig. 6.1 shows two similar metal cans. One has a dull black surface and the other has a shiny silver surface. The cans are filled with equal volumes of water. A lid, with a thermometer, is placed on each can. The cans are placed the same distance from an electric heater. The initial temperature of the water in each can is the same.

The heater is switched on.

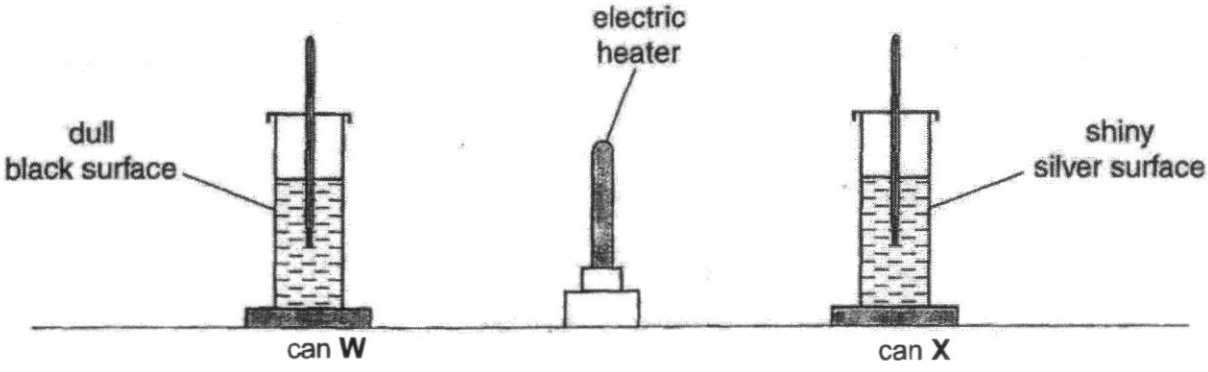


Fig. 6.1

(a) Name the process by which energy from the electric heater reaches the cans.

.....[1]

(b) The temperature of the water in both cans rises.

In which can, **W** or **X**, will the temperature rise more quickly? Explain your answer.

.....

.....

.....[2]

(c) Fig. 6.2 shows two similar cans **Y** and **Z**. The cans are filled with the same volume of water at 80 °C. A lid, with a thermometer, is placed on each can.

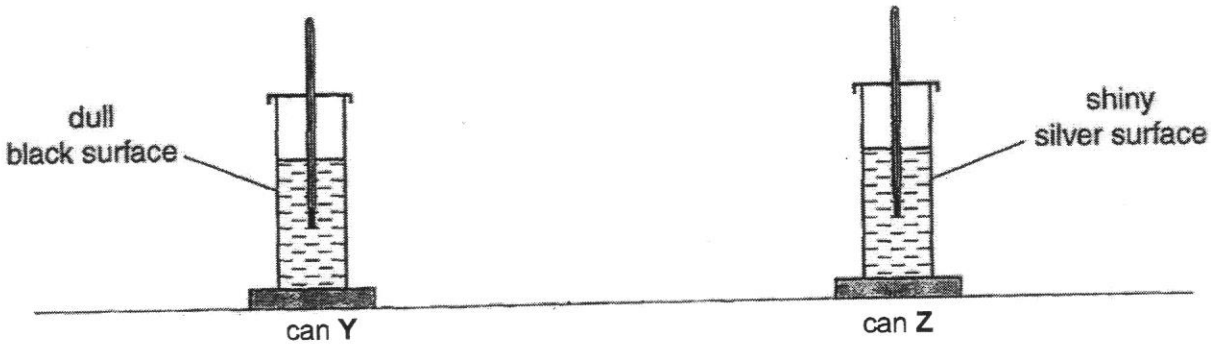


Fig. 6.2

The temperature of the water in both cans falls.

In which can, **Y** or **Z**, will the temperature drop more quickly? Explain your answer.

.....

.....

.....[2]

[Total: 5]

B7 Fig. 7 shows a square-shaped glass apparatus with an opening **X** at the top.

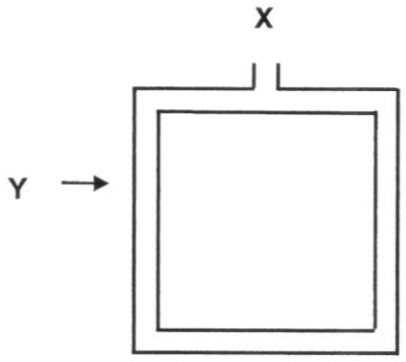


Fig. 7

The glass apparatus is filled with water.

A drop of red dye is added at **X**, and an ice pack is placed at point **Y**.

(a) On Fig. 7, by using arrows, draw the direction the drop of dye added at **X** will move. [1]

(b) Explain your answer for **(a)**.

.....

.....

.....

.....[3]

(c) Name the method heat is transferred throughout the water in the glass apparatus.

.....[1]

[Total: 5]

B8 A series of experiments were conducted to investigate the effect of various conditions on rusting.

In the first experiment, 2 nails were placed in 2 different test-tubes, treated, and left to stand for a few days. Table 8.1 shows the conditions the nails were exposed to and the results for the first experiment.

Table 8.1

nail	test-tube	results
A	with boiled distilled water	10% covered with rust
B	with distilled water	60% covered with rust

In the second experiment, 2 nails were placed in another 2 different test-tubes, treated, sealed, and left to stand for a week. Table 8.2 shows the conditions the nails were exposed to and the results for the second experiment.

Table 8.2

nail	test-tube	results
C	air is removed	0% covered with rust
D	air is not removed	20% covered with rust

In the third experiment, 4 nails were placed in 4 different test-tubes, treated, sealed, and left to stand for a week. Table 8.3 shows the conditions the nails were exposed to.

Table 8.3

nail	test-tube	layer of oil added
E	with boiled distilled water	no
F	with boiled distilled water	yes
G	with distilled water	no
H	with distilled water	yes

After a week, rust appeared on some of the nails.

(a) Based on these experiments, state the condition(s) needed for rusting to take place.

.....[1]

(b) For this third experiment, arrange the nails in sequence, from the nail with least or no rust to the nail with the most rust observed.

.....[1]

(c) Name one way to prevent an iron nail from rusting.

.....[1]

[Total: 3]

SECTION C (30 marks)

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

C1 **(a)** Michael is conducting an experiment about light and reflection in the laboratory. He is using mirrors to reflect a light ray from a ray box several times. Fig. 1.1 is a sketch of his experiment which shows the positions of the ray box and path of the light ray.

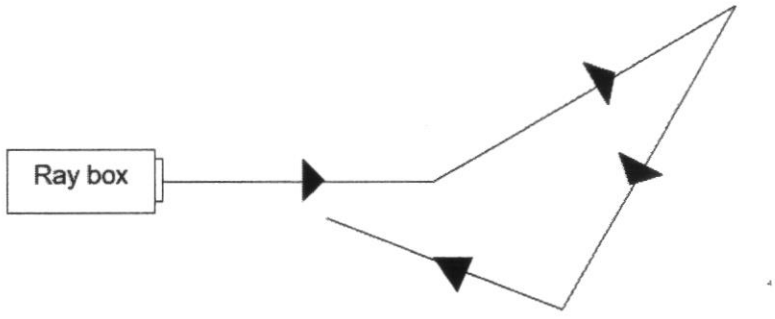


Fig. 1.1

Determine the positions of the mirrors and draw them onto Fig. 1.1.

Use a straight line of about 2 cm long to represent each mirror. [2]

(b) Two transparent blocks made of materials **R** and **S** are stacked on top of one another. Air is optically less dense than **R** and **S**.

Fig. 1.2 shows what happens to light as it passes from air into **R** and **S**.

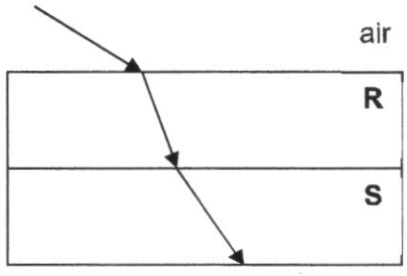


Fig. 1.2

(i) Name the process that occurs as light passes from air into **R** and **S**.

.....[1]

(ii) Which material, **R** or **S**, has a higher optical density?

Explain your answer.

.....

.....[1]

(iii) On the diagram, draw the path of the light ray after it leaves medium **S**. [1]

(iv) Two blocks of material **S** are stacked on top of each other.

Draw, on Fig. 1.3, the path of the light ray as it enters the two blocks.

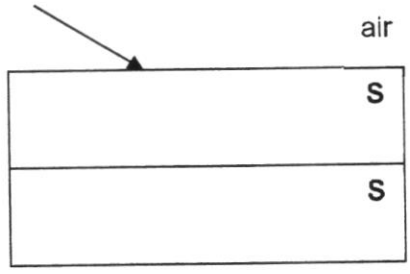


Fig. 1.3

[1]

(c) Fig. 1.4 shows a flower with red and yellow petals.

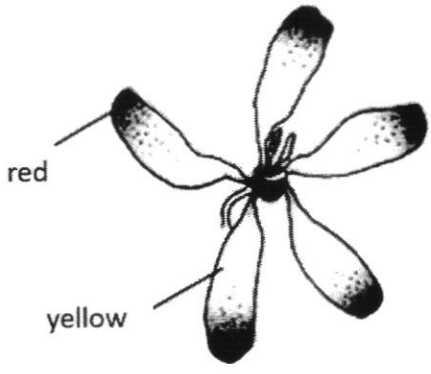


Fig. 1.4

(i) State the colour of the flower observed when it is placed under red light.

Give a reason for your answer.

.....

.....[2]

(ii) State the colour of the flower observed when it is placed under green light.

Give a reason for your answer.

.....

.....[2]

[Total: 10]

C2 Fig. 2.1 shows a boy standing on his skateboard at the top of a track. The total weight of the boy and his skateboard is 500 N.

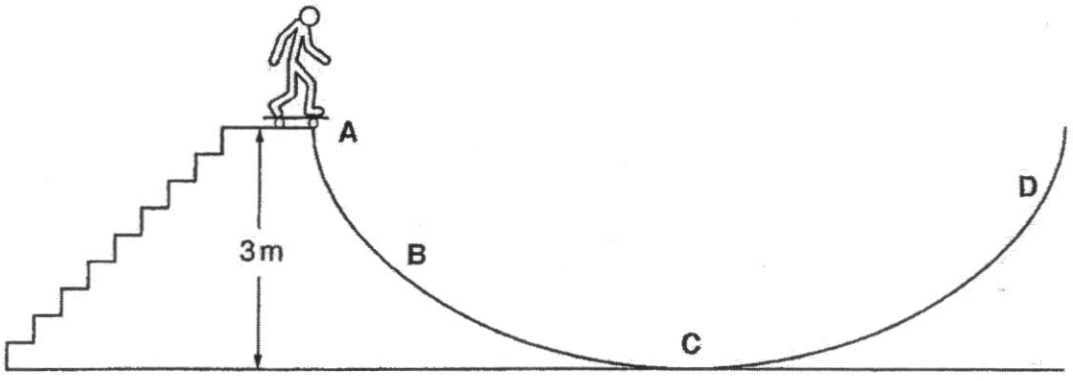


Fig. 2.1

(a) State what is meant by *energy*.

.....[1]

(b) Calculate the work done by the boy in carrying his skateboard from the bottom to the top of the stairs.

work done = ... [2]

(c) At the top of the stairs, the boy carries the skateboard in his hand.

State if work is done on the skateboard. Explain your answer.

.....

.....[1]

(d) State the type of energy the boy gains as he climbs to the top of the stairs.

.....[1]

(e) The boy travels on his skateboard until he reaches point **D** on the track, where he stops momentarily.

(i) State the energy conversion that occurs to the energy named in part **(d)** as he moves down the track from point **A** to point **C**.

.....

.....[1]

(ii) Explain why point **D** is lower than point **A**.

.....

.....[1]

(iii) Explain why the boy eventually stops at point **C**.

.....

.....[1]

(f) Fig. 2.2 shows a Newton's cradle. A typical Newton's cradle consists of metal balls suspended in a metal frame so that they are just touching each other at rest. When one sphere at the end is lifted and released, it strikes the stationary spheres, transmitting a force through the stationary spheres that pushes the last sphere upward. This sphere then swings back and strikes the spheres, repeating the effect in the opposite direction.

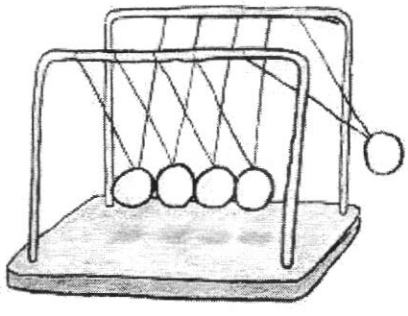


Fig. 2.2

(i) Suggest the principle that explains why the spheres will swing back and forth.

.....

.....[1]

(ii) Suggest why the spheres can theoretically go on indefinitely if the Newton's cradle is placed in a vacuum container.

.....

.....[1]

[Total: 10]

C3 Fig. 3 shows the ingredients list from a bottle of fruit juice, listing its chemical contents.

Ingredients:
carbonated water
sugar
citric acid
apple flavour
sodium benzoate
saccharin

Fig. 3

(a) State which one of these chemicals has a sour taste.

.....[1]

(b) Suggest the pH value of this fruit juice.

.....[1]

(c) Citric acid can react with other compounds to bring about a chemical change.

Describe the term 'chemical change'.

.....

.....[1]

(d) Citric acid can react with carbonates. An example of a common carbonate used in food is sodium carbonate.

(i) Complete the word equation in the space below.

acid	+	carbonate	→

[1]

(ii) Describe what is observed when citric acid reacts completely with an exact portion of sodium carbonate in a test-tube.

.....

.....[1]

(iii) The reaction is tested with both blue litmus paper and red litmus paper before the reaction and after the reaction has stopped.

Complete the table to indicate the colour before and after the reaction in **(d)(ii)**.

	before	after
blue litmus paper		
red litmus paper		

[2]

(iv) Describe the mass of the products when compared to the mass of the reactants for the reaction in **(d)(ii)**.

.....[1]

(e) The formation of acid rain is another example of an acid reacting with other compounds to bring about a chemical change.

(i) Name a substance that dissolves in rain water to form 'acid rain'.

.....[1]

(ii) Name an effect of acid rain.

.....

.....[1]

[Total: 10]

END OF PAPER

Answers to 2021 LSS Sec 2 Express EOY Examination

Section A

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

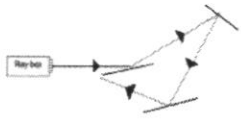
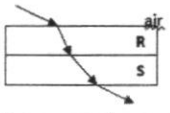
Section B

B1a	• There is a higher concentration of iodine in the beaker than the visking tubing. • The iodine molecules (particles) move into the visking tubing; • by diffusion.	R: iodine solution / iodine solution molecules move
B1b	• partially permeable	R: semi-permeable R: description of partially permeable Spelling Error: 0
B1c	• Starch molecules are not able to diffuse out because they are too big to pass through the partially permeable membrane.	R: starch solution cannot diffuse (ECF if penalised for iodine solution in B1a)
B2a	• A – Produce sperms OR produce (male) sex hormones. • B – Secrete fluid/semen containing nutrients and/or enzymes OR nutrients and/or enzymes to supply energy to the sperms (to move) OR produce (male) sex hormones	R: A - store sperms R: B - produce semen only (technically semen is seminal fluid plus sperms)
B2b	• Vasectomy	Spelling error: 0
B2c	• (anywhere along the sperm duct)	

B3a	• A – mouth • B – small intestine	
B3b	• C – proteins • D – lipids / fats	
B3c	• meat / yoghurt / milk / eggs / beans / peas / lentils / nuts / fish / other reasonable answers (Any 2)	Accept: types of meat/fish, etc. as separate answers (2 examples needed to score 1 m). Reject: vegetables (vague)
B3d	• Amylase / carbohydrase from the mouth. • Continues to act on/digest the starch in the bolus as it travels to the stomach.	
B4ai	• Spring balance / Newton-meter / Force-meter	
B4aii	• Left facing arrow <u>on the surface of the floor, touching the object</u> OR Left facing arrow, touch the object OR Left facing arrow under the object (up to the end of object on right side)	
B4b	• Pressure = (50 + 500) / (4 x 5 x 5) [M] • = 5.5 N/cm^2 [A]	
B5a	• Echo	
B5b	• Distance = speed x time = (1500 x 0.1)/2 [M] • = 75 m [A]	
B5c	• Longer time taken / Slower detection or delayed detection or later detection	R: mention of speed (e.g. slower reflection of sound)
B5d	• Speed of sound in air is slower than speed of sound in liquid OR particles further apart in air, hence longer time to pass the vibrations	
B5e	• Loudness – loudness <u>increased</u> AND <u>amplitude</u> / <u>size of vibrations</u> / <u>sound waves are larger</u> in S2 than S1 • Pitch – pitch <u>increased</u> AND <u>frequency</u> / <u>higher number of cycles</u> in S2 than S1	Accept numerical value for effect Size (accept height / taller, reference to size of waves)

B6a	• Radiation	
B6b	• W as a dull and/or black surface • Is a better absorber of radiation than a shiny silver surface	• R: gain/absorb heat faster • R: bad radiator (contradictory) • (Idea of property, not process - it is obvious that heat has been gained from the question)
B6c	• Y as a dull and/or black surface • Is a better emitter or radiator of heat than a shiny silver surface	• R: lose/emit/radiate heat faster • (Idea of property, not process)
B7a	• (anti-clockwise direction)	Arrows could be drawn inside or outside the apparatus, but if drawn outside the apparatus (and within the square area), it should be clear to the marker that it is indicating current flow in the apparatus, and not current flow in the square area (in the middle of the square).
B7b	• At point Y, water molecules slow down / lose heat / energy (idea of energy lost) • Becomes closer / denser and sinks (idea of density) • Water moves to fill the void, carrying dye from X to Y / moves anti-clockwise / down left column (idea of movement)	R: becomes colder
B7c	• Convection	
B8a	• Air / oxygen AND water / moisture	
B8b	• F, E, H, G	
B8c	• Painting / Coating with a layer of oil / Surrounding with a drying agent / Electroplating	BOD: seal in a vacuum bag R: put in freezer (air/moisture still present)

Section C

C1a	 • All correct: 2m; 2 correct: 1m; <2 correct: 0m	Mark according to template, no allowance for margin of error.
C1bi	• Refraction	
C1bii	• R when a light ray enters medium S (from R), it bends away from the normal.	
C1biii	 • Emergent ray at S is parallel to incident ray at R.	Mark according to template, no allowance for margin of error. Arrowhead for emergent ray necessary.
C1biv	 • Straight ray throughout S	Arrowhead for refracted ray in S necessary.
C1ci	• Red parts appears red as red light is reflected • Yellow parts appears red as red light is reflected	Accept: whole flower appears red; whole flower can only reflect red
C1cii	• Yellow parts appears green as green light is reflected • Red parts appears black as green light is absorbed / no light is reflected	
C2a	• Ability to do work	
C2b	• Work done = force x distance = 500 x 3 [M] • 1500 (J) [A] (units not required)	Annotate if units are incorrect.
C2c	• No. There is no movement in the direction of the force applied.	
C2d	• Gravitational potential energy.	Spelling error: 0
C2ei	• Gravitational potential energy to kinetic energy.	
C2eii	• Some of the gravitational potential energy is converted to sound energy and/or heat	

	energy, hence <u>less total energy / gravitational potential energy at point D</u>	
C2eiii	• <u>All</u> of the gravitational potential energy / kinetic energy <u>/ total energy has been converted into heat energy and/or sound energy.</u>	
C2fi	• <u>Conservation of energy</u> OR <u>Energy can only be changed from one form to another, it cannot be created or destroyed</u>	
C2fii	• <u>No energy is converted to sound and/or heat</u> as there is <u>no matter / medium present</u> in a <u>vacuum</u>.	Accept: no energy is lost Accept: no air / air resistance in vacuum
C3a	• Citric acid	
C3b	• Less than 7 / any values between 3 to 6 (i.e., 3, 4, 5, 6)	R: 0, 1, 2
C3c	• Formation of new product(s) OR Irreversible OR Heat may be gained or lost	A: new properties of the substances formed.
C3di	• Salt + water + carbon dioxide	
C3dii	• Effervescence / bubbling in the solution	A: foam / foaming (BOD) R: gas / salt produced Spelling error: no penalty
C3diii	• Blue litmus – red; blue [1] • Red litmus – red; red [1]	Must indicate colour R: stays the same
C3div	• Same	
C3ei	• Sulfur dioxide / oxides of nitrogen	Accept: nitrogen oxide / nitrogen dioxide Spelling error: 0 R: sulfuric acid, nitric acid
C3eii	• Destroys forest (kills many trees) / corrodes buildings/structures / kills fishes/aquatic lives	