FUKIEN SECONDARY SCHOOL

S2 Final Examination (2020-2021)

Integrated Science

(1 hour)

Date: 22nd June 2021 Name:_____

Time: 8:30a.m. - 9:30a.m. Class: _____ No.:_____

Instructions to students:

1. Write your name, class and class number on both the question paper and the answer sheets.
2. Answer ALL questions.
3. Write down all the answers on the answer sheets.
4. Hand in the question paper and the answer sheets at the end of the examination.
5. The total mark of the paper is 100.

Section A: Multiple Choice Questions (40 marks)

***Directions*:** Questions 1 and 2 refer to the table below which shows the pH values of four different solutions.

Solution	P	Q	R	S
pH value	1	9	13	7

1 Which solution does NOT change the colours of blue and red litmus paper?

A Solution P
B Solution Q
C Solution R
D Solution S

2 Which solution will react with magnesium to produce hydrogen?

A Solution P
B Solution Q
C Solution R
D Solution S

3 Which of the following contain(s) acids?

(1) Grape
(2) Toilet cleaner
(3) Glass cleaner

A (1) only
B (1) and (2) only
C (2) and (3) only
D (1), (2) and (3)

4 Which of the following liquids turn(s) red litmus paper blue?

(1) Lemon juice
(2) Bleach
(3) Distilled water

A (1) only
B (2) only
C (1) and (2) only
D (1), (2) and (3)

5 Which of the following containers is NOT suitable for holding lemon juice?

A Iron bucket
B Glass bottle
C Plastic cup
D Clay pot

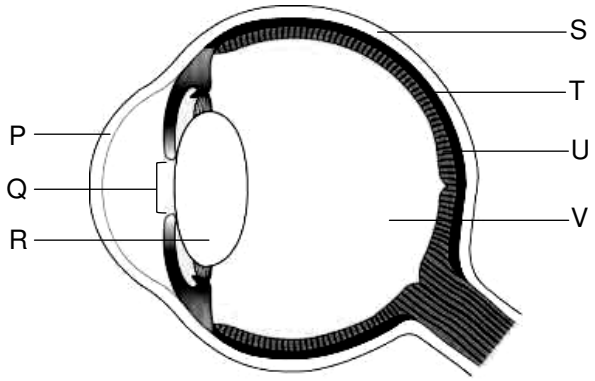
6 Below what pH value is rainwater considered as acid rain?

A pH 4
B pH 5.6
C pH 7
D pH 7.6

7 Which of the following ways will lead to an increase in the pH value of the solution?

A Diluting a concentrated sodium hydroxide solution
B Dissolving salt in distilled water
C Adding dilute sodium hydroxide solution to dilute hydrochloric acid
D Adding a drop of universal indicator to dilute nitric acid

***Directions*:** Questions 8 and 9 refer to the diagram below which shows the main parts of a human eye.



8 Which part(s) is/are transparent?

A Part P only
B Part R only
C Parts P, R and V only
D Parts P, R, S and V only

9 Which of the following changes occurs when an eye with normal eyesight is looking at a near object?

A Part R becomes thinner.
B Part R becomes thicker.
C Part Q becomes smaller.
D Part Q becomes larger.

10 Which of the following correctly matches the stimulus with its corresponding sense?

	Stimulus	Sense
A	Light	Sight
B	Chemicals in air	Taste
C	Hot object	Temperature
D	Sound	Vibration

11 Sound travels the fastest in

A solids.
B liquids.
C gases.
D a vacuum.

12 Which of the following statements about sound is INCORRECT?

A Sound is produced by vibration of objects.

B The loudness of sound is measured in decibels.

C Sound travels faster in air than in water.

D Some animals can hear sounds at frequencies that humans cannot hear.

13 Which of the following are the possible effects of drugs on our body?

(1) Lose control of movement

(2) Shorten our reaction time

(3) Cause addiction

A (1) and (2) only

B (1) and (3) only

C (2) and (3) only

D (1), (2) and (3)

14 Which of the following statements about forces is / are correct?

(1) Forces always occur in pairs.

(2) Forces may change the direction of movement of objects.

(3) If the forces acting on an object are unbalanced, the object must speed up.

A (2) only

B (1) and (2) only

C (1) and (3) only

D (1), (2) and (3)

15 In which of the following cases is / are friction useful?

A Picking up food with a fork

B Opening a jar of jam

C Holding a pen

D All of the above

16 Which of the following statements about an action-and-reaction pair must be correct?

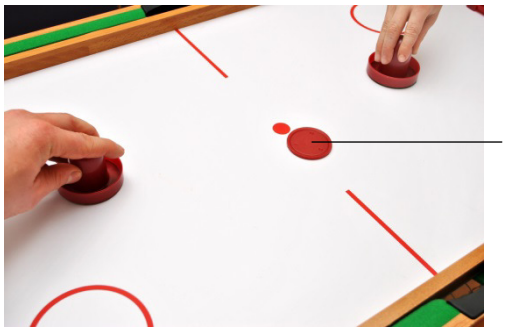
A They act on the same object.

B They act in the same direction.

C They are equal in size.

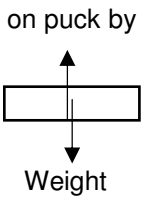
D They are contact forces.

17 In air hockey, the puck is lifted up by a layer of air.



Which of the following is the correct free-body diagram of the puck?

A



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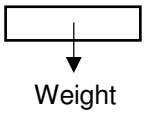

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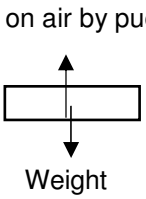

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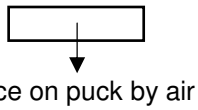


18 Which of the following statements about air resistance is INCORRECT?

A Parachutes make use of air resistance to slow down a falling sky diver.

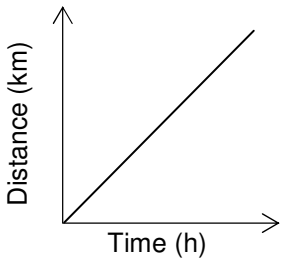
B Air resistance always opposes the motion of an object.

C No air resistance acts on an object if the object is at rest in still air.

D The slower an object moves in air, the greater is the air resistance acting on it.

19 A bus keeps speeding up on a straight road. Which of the following is the correct distance-time graph of the bus?

A



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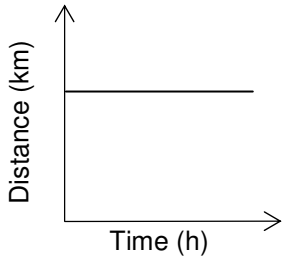

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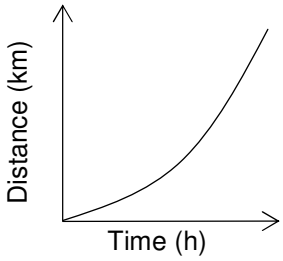

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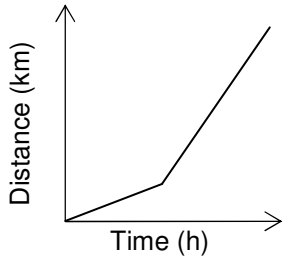


20 The diagram below shows a person pushing a box. Some of the forces acting on the box and the person are labelled as (1) to (5).

(1) Force by box on person
(2) Force by person on box
(3) Weight of box
(4) Force by floor on box
(5) Friction by floor on person

Which of the following forces are action-and-reaction pairs?

A (1) and (2)
B (2) and (4)
C (3) and (4)
D (3) and (5)

END of Section A

Section B: Structured Questions (60 marks)

1 Amy has four beakers of colourless solutions. She uses pieces of red and blue litmus paper to test the four solutions. The results are shown in the table below.

Solution	Change of red litmus paper	Change of blue litmus paper
A	Turns blue	No change
B	No change	No change
C	No change	Turns red
D	No change	Turns red

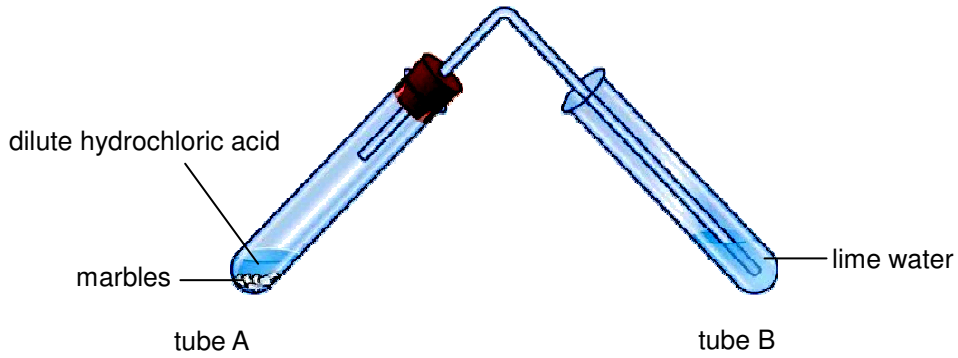
a i Which solution(s) is/are alkaline? (1 mark)

ii Which solution(s) is/are acidic? (1 mark)

b Suggest a substance that solution B may be. (1 mark)

c Which solution has the highest pH value? (1 mark)

2 Andy is doing an experiment to study the reaction between dilute hydrochloric acid and marble. His experimental set-up is shown below.



a State a safety precaution that Andy should take in his experiment. (2 marks)

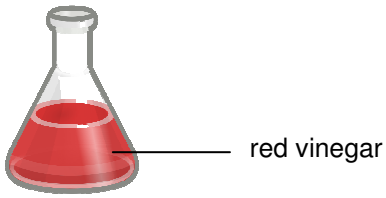
b What is observed in tube A? (2 marks)

c i What is observed in tube B? (2 marks)

ii What does the observation in c i show? (1 mark)

d According to the result of this experiment, what should we pay attention to when we use cleaners to clean marble surfaces? (2 marks)

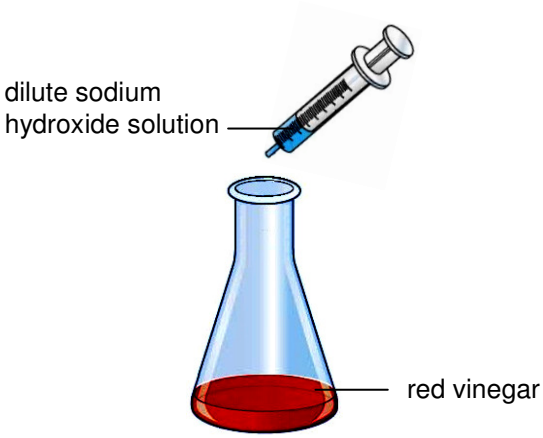
3 The flask below contains red vinegar. Mary wants to find the pH value of the liquid.



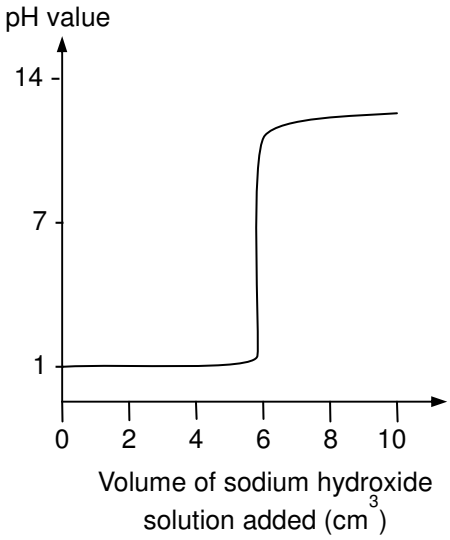
a Explain why universal indicator is NOT suitable for Mary's purpose. (2 marks)

b Suggest ONE instrument that is suitable for Mary's purpose. (1 mark)

Mary uses a syringe to add 10 cm^3 of dilute sodium hydroxide solution to the flask containing 10 cm^3 of red vinegar, 1 cm^3 each time.



The change in pH value of the resulting solution is shown in the graph below.

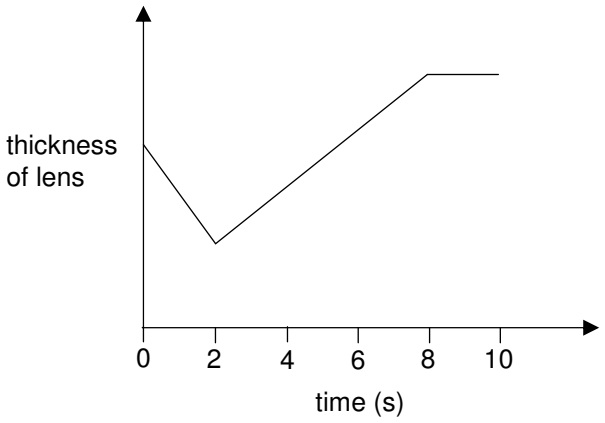


c What is the pH value of the red vinegar? (1 mark)

d Describe briefly the change in pH value of the resulting solution. (2 marks)

e How much dilute sodium hydroxide solution is needed to neutralize 10 cm^3 of red vinegar? (1 mark)

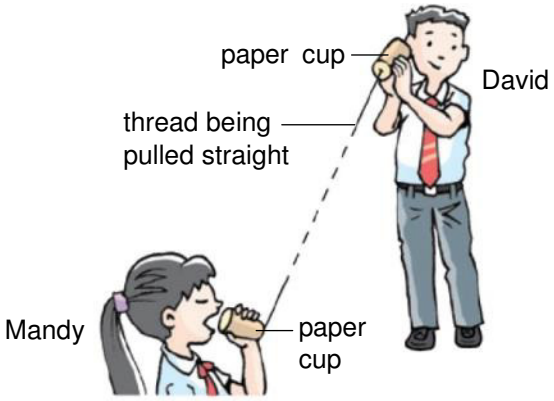
4 The graph below shows the thickness of the lens in a boy with normal eyesight in 10 seconds.



a In which period is the boy looking at a stationary object? Explain your answer.
(3 marks)

b In which period is the boy looking at an object moving towards him? Explain your answer. (3 marks)

5 David and Mandy are doing an experiment as shown below. Mandy speaks softly into the paper cup and David listens through the other cup.



a David can hear Mandy's voice in the paper cup. What can be told from the result?
(2 marks)

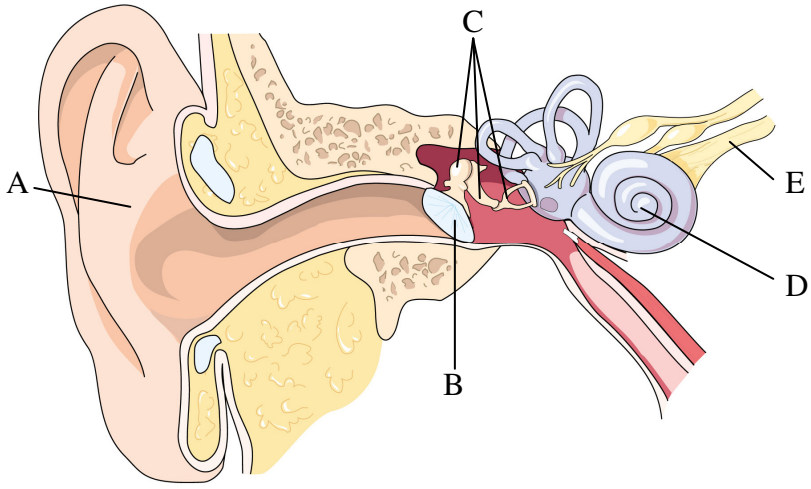
b Explain why David cannot hear Mandy's voice if she holds the thread with her hand.
(2 marks)

6 The photo below shows a facility in a MTR station. Visually impaired people reads the information displayed on the facility with his/her fingertips.

a Name the sense organ involved in the process. (1 mark)

b Why are fingertips but not the palms or the back of the hands used to read the information? (2 marks)

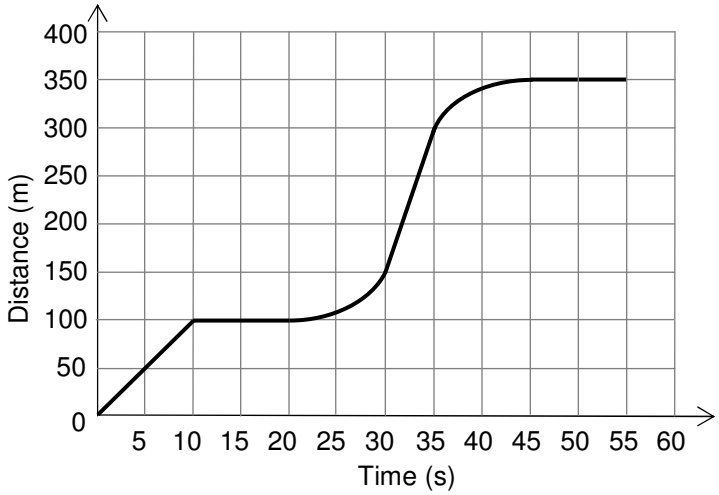
7 The following diagram shows the internal structure of an ear.



a Name structures B, C and D. (3 marks)

b Write down the functions of A and E in hearing. (4 marks)

8 The diagram below shows a distance-time graph of a bus.



a What is the total distance travelled by the bus? (1 mark)

b State the time periods during which the bus is at rest. (2 marks)

c Find the average speed (in ms^{-1}) of the bus from 0–20 s. Show your workings. (2 marks)

d Is the bus in uniform motion or non-uniform motion during 35–45 s? (1 mark)

e Another bus takes 30 seconds to travel from A through B to C. It takes 10 seconds to travel the first 10 m from A to B. Then it stops for 5 seconds at B. It starts again and travels at 2 ms^{-1} to reach C.

On the Answer Sheet, complete the distance-time graph of the bus. (3 marks)

9 An investigation was carried out to find out the relationship between launch angle and the horizontal distance travelled by a water rocket.

The results are as follows:

Launch angle	Horizontal distance travelled by the rocket (m)
10°	7
20°	21
30°	40
45°	59
50°	56
60°	45

a On the Answer Sheet, draw arrows to show the directions of the force of gravity acting on the water rocket at different positions. (2 marks)

b Plot a graph of horizontal distance travelled by the rocket against launch angle. (5 marks)

c Complete the variables table for this experiment. (4 marks)

Hints:

launch angle *amount of air pumped into the rocket*

amount of water in the rocket *horizontal distance travelled by the rocket*

End of Paper