

FUKIEN SECONDARY SCHOOL
S1 Final Examination (2020-2021)
Integrated Science
(1 hour)

Date: 15th June 2021

Name: _____

Time: 9:45a.m. – 10:45a.m.

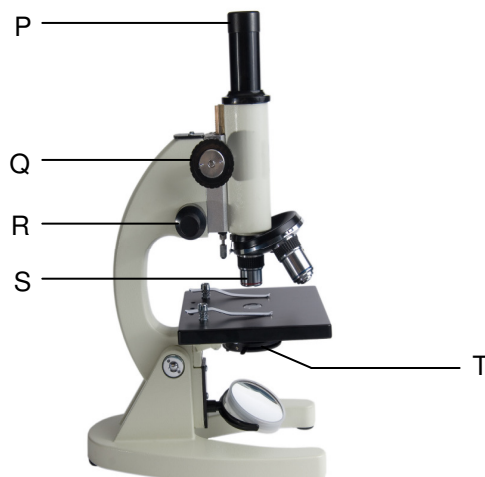
Class: _____ No.: _____

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)

1. The photo below shows a light microscope.



Which labelled part is the coarse adjustment knob?

- A Part Q
B Part R
C Part S
D Part T
2. The total magnification of a microscope using an eyepiece with magnification 5X is 100X. What is the magnification of the objective?
- A 5X
B 10X
C 15X
D 20X

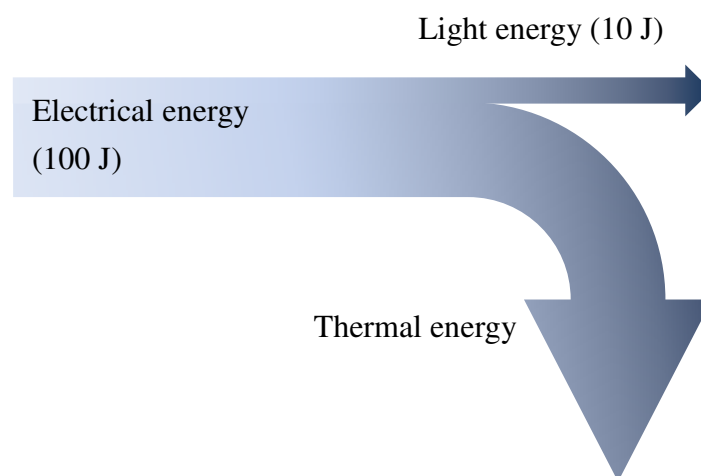
3. Which of the following statements about cell division is/are correct?
- (1) During cell division, all DNA in the nucleus makes a copy of itself.
 - (2) After cell division, the new cells will grow to the size of the original cell.
 - (3) Cell division occurs when a multicellular organism grows.
- A (2) only
B (1) and (2) only
C (1) and (3) only
D (1), (2) and (3)
4. Which of the following statements about cell differentiation is/are correct?
- (1) It gives rise to different types of cells.
 - (2) Cells become specialized for particular functions.
 - (3) It results in an increase in the number of cells.
- A (1) only
B (1) and (2) only
C (2) and (3) only
D (1), (2) and (3)
5. Which of the following statements about human sex cells is correct?
- A The head of the sperm contains a lot of food substances.
B A sperm and an ovum are similar in size.
C An ovum has a nucleus.
D An ovum can move by itself.
6. In human males, the sperm ducts serve to
- (1) carry urine out of the body.
 - (2) carry semen to the female reproductive system.
 - (3) carry sperms from the testes to the urethra.
- A (2) only
B (3) only
C (1) and (2) only
D (1) and (3) only
7. Which of the following statements about the menstrual cycle is/are correct?
- (1) Menstruation is a sign of sexual maturity.
 - (2) The thickening and breaking down of the uterine lining occurs.
 - (3) Menstruation usually lasts for 28 days.
- A (1) only
B (2) only
C (1) and (2) only
D (2) and (3) only

8. When the sand falls, which form of energy does it gain?



- A Kinetic energy
- B Potential energy
- C Sound energy
- D Electrical energy

9. A Sankey diagram of an electric lamp is shown below.



What is the possible amount of energy output which is not useful?

- A 10 J
- B 50 J
- C 90 J
- D 100 J

10. Which of the following combinations correctly matches the structure with its function?

<u>Structure</u>	<u>Function</u>
A Amnion	Provides nutrients and oxygen to the embryo
B Placenta	Secretes amniotic fluid
C Vagina	Allows exchange of substances between the mother and the embryo
D Umbilical cord	Carries substances between the mother and the embryo

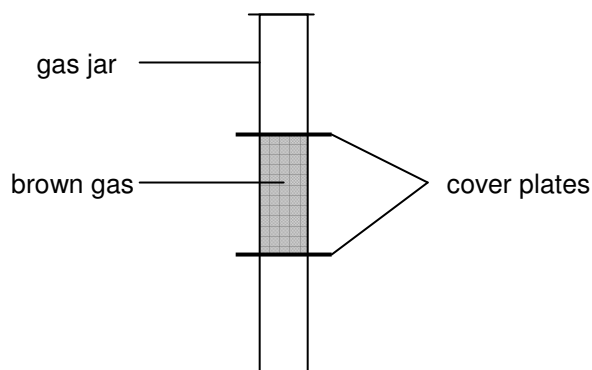
11. Which of the following statements about convection is/are correct?

- (1) Thermal energy is transferred upwards by the movement of the liquid or gas.
 - (2) It can occur in a vacuum.
 - (3) Heaters and air conditioners are applications of it.
- A (1) only
B (2) only
C (1) and (3) only
D (1), (2) and (3)

12. Which of the following is/are example(s) of matter?

- (1) Water
 - (2) Air
 - (3) Rock
- A (3) only
B (1) and (2) only
C (1) and (3) only
D (1), (2) and (3)

13. In the following figure, if the two cover plates are removed, where will the brown gas move to?

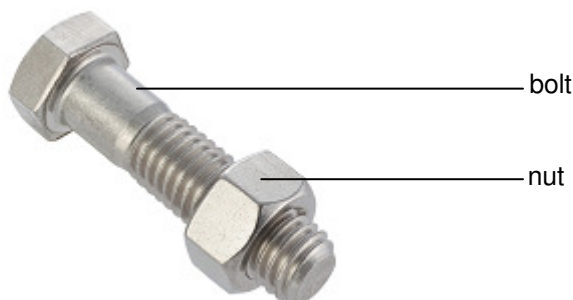


- A The brown gas will move upwards.
B The brown gas will move downwards.
C The brown gas will not move.
D The brown gas will move both upwards and downwards.

14. Which of the following does not have a fixed volume or a fixed shape?

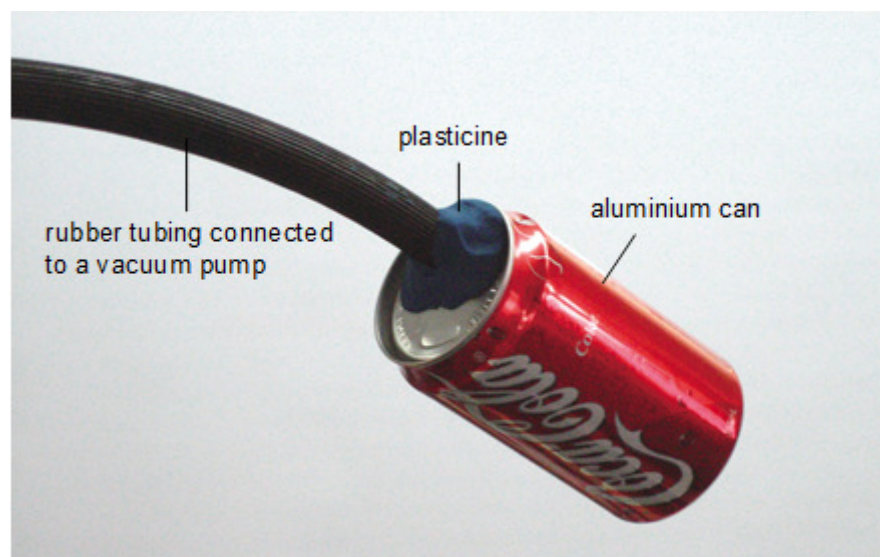
- A Air
B Ice
C Wood
D Stone

15. Jacky adds 5 cubes of sugar into 500 cm^3 of hot tea. The volume of each cube of sugar is 1 cm^3 . After stirring, he finds that the total volume of the tea is less than 505 cm^3 . Which of the following is the correct explanation?
- A The sugar is not completely dissolved in the tea.
 - B The particles of the sugar become smaller after dissolving.
 - C The water particles in the tea fill the spaces between the sugar particles.
 - D The particles in the tea become more closely packed after the sugar dissolves.
16. When a balloon is put into a tank of hot water,
- A the spaces between the air particles in the balloon increase.
 - B the spaces between the air particles in the balloon decrease.
 - C the density of the air in the balloon increases.
 - D the air particles in the balloon expand.
17. A bolt is heated for a while. After heating, the bolt does not fit its corresponding nut. Which of the following correctly explains this phenomenon?



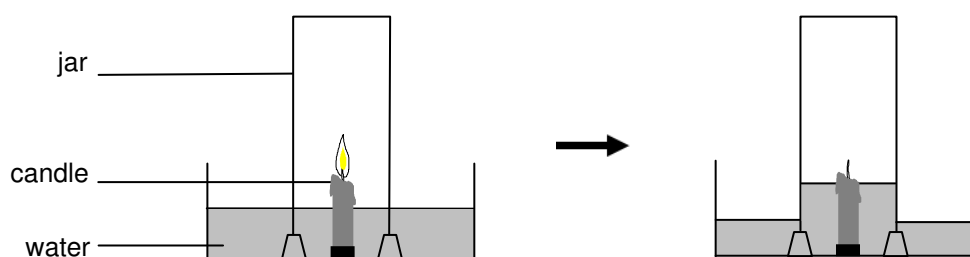
- A Metal contracts when heated.
 - B Metal expands when heated.
 - C The particles of metal expand when heated.
 - D The particles of metal contract when heated.
18. Which of the following is/are the reasons that alcohol is used inside a fire sprinkler?
- (1) Alcohol expands a lot when temperature increases.
 - (2) Alcohol is a good solvent.
 - (3) It is flammable.
- A (1) only
 - B (2) only
 - C (1) and (2) only
 - D (2) and (3) only

19. When we remove the air inside an aluminium can using a vacuum pump as shown below, the can collapses.



Which of the following correctly explains the above phenomenon?

- A The gas pressure inside the can becomes higher than the atmospheric pressure.
 - B The gas pressure inside the can becomes lower than the atmospheric pressure.
 - C The gas particles inside the can get closer.
 - D The gas particles inside the can get further apart.
20. A burning candle is placed in a tank of water. After the burning candle has been covered by an empty jar for a while, the candle goes out and the water level rises. Which of the following explain(s) the rise of water level?

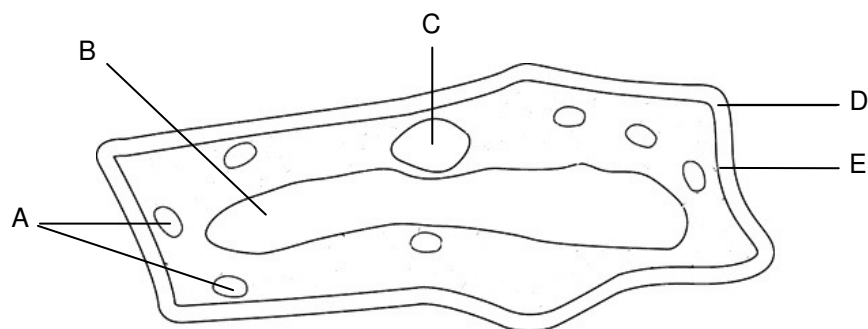


- (1) Part of the candle has melted.
 - (2) The air pressure inside the jar decreases.
 - (3) The candle fire is put out by the water.
- A (2) only
 - B (1) and (2) only
 - C (1) and (3) only
 - D (2) and (3) only

END of Section A

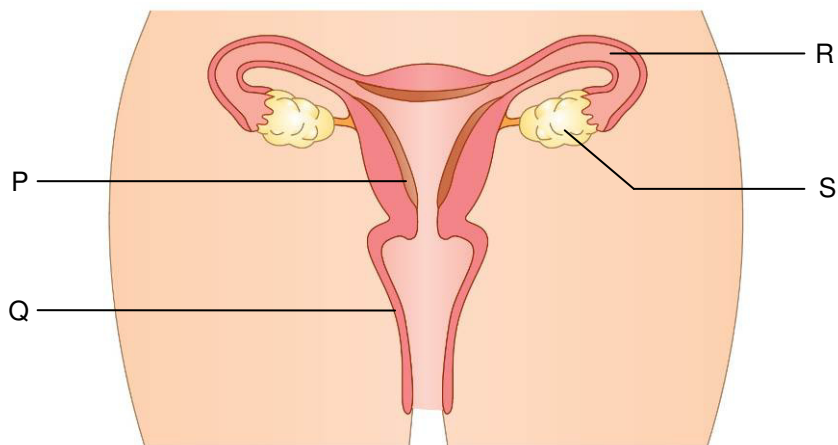
Section B: Structured Questions (60 marks)

1. The diagram below shows a plant cell.



- (a) Use the letters in the diagram to answer the questions.
- (i) Write TWO structures in the diagram NOT found in animal cells. (2 marks)
 - (ii) Which structure in the diagram stores water and dissolved minerals? (1 mark)
 - (iii) Which structure in the diagram contains DNA? (1 mark)
- (b) Name structures C, D and E. (6 marks)
- (c) Give ONE function of structure D. (2 marks)

2. The diagram below shows the reproductive system of a woman.



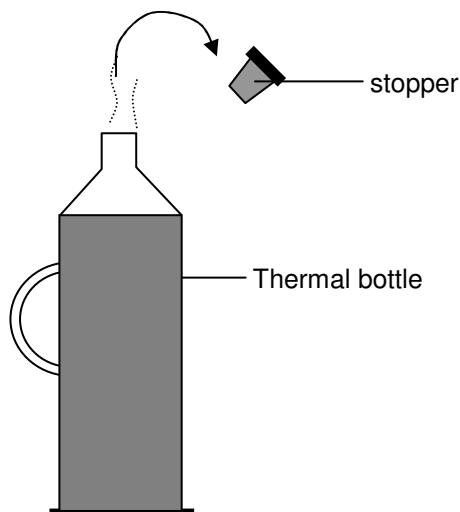
- (a) Using the letters in the diagram, state the structures in which the following processes take place.
- (i) Production of ova (1 mark)
 - (ii) Fertilization (1 mark)
 - (iii) Implantation of an embryo (1 mark)
- (b) Secondary sexual characteristics appear due to the increased levels of sex hormones in the body during puberty.
- (i) Write the name of the structure which produces the sex hormones in female. (2 marks)
 - (ii) State ONE secondary sexual characteristic of females. (2 marks)

3. A group of students went camping and they boiled some water with burning firewood.



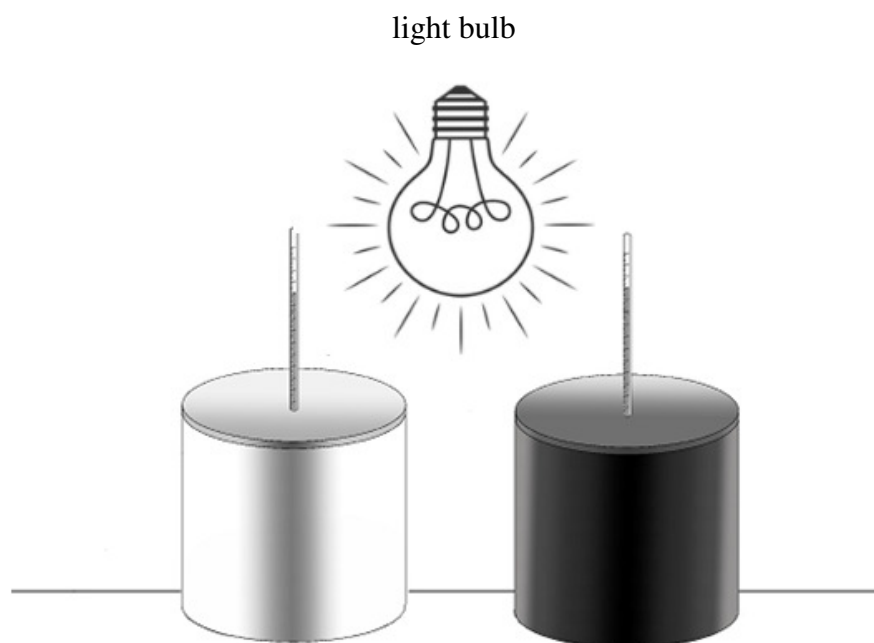
Boil water with burning firewood.

- (a) Complete the following energy conversion involved in boiling the water. (4 marks)
- _____ energy stored in the firewood →
_____ energy of the fire →
_____ energy of water + _____ energy of water
- (b) Is the heat transfer process **from the pot to the water** conduction or convection? Explain your answer. (4 marks)
4. If we pour some hot water into a thermal bottle and put the stopper back immediately, the stopper may jump up. Explain why this happens by completing the blanks with suitable word(s). (6 marks)



The (a) _____ inside the flask is heated by the hot water and it (b) _____.
The (c) _____ inside the bottle increases therefore the air pushes the stopper to jump up.

5. Cindy aims to compare the absorption of thermal energy by different materials. She prepares two cans of the same shape and size, one with a dull black surface and the other with a shiny white surface. The two cans are filled with the same amount of water and are placed at the same distance from a light bulb.



The water temperatures in the two cans are recorded accordingly.

	Can with dull black surface	Can with shiny white surface
Initial water temperature (°C)	26	26
Final water temperature (°C)	30	28

- Calculate the rise in water temperature in each can. (2 marks)
- Write the name of the apparatus that could be used to measure temperature. (2 marks)
- State the main heat transfer process from the light bulb to the can. Give TWO reasons to support your answers. (6 marks)
- Complete the variables table by using the given variables. (5 marks)

The rise in water temperature

Distance from a light bulb to each can

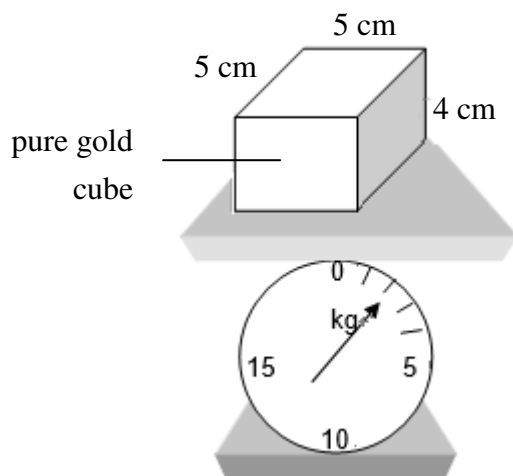
The color of the surface of the can

The shape and size of the cans

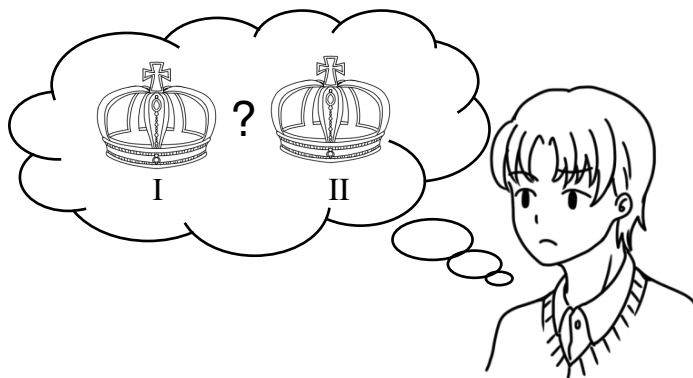
The amount of water in each can

- What can be concluded from this experiment? (2 marks)

6. The diagram below shows a pure gold cube. The size and mass of the pure gold cube are given in the diagram.



- (a) Calculate the volume, in cm^3 , of the pure gold cube. Show your calculations. (2 marks)
- (b) What is the mass, in g, of the pure gold cube? (2 marks)
- (c) Calculate the density, in g/cm^3 , of the pure gold cube. Show your calculations. (2 marks)
- (d) A student has two gold crowns I and II. Only one of the crowns is made of pure gold. He tries to find out which is which by taking some measurements of the two gold crowns.



The table below shows the measurements.

	Crown I	Crown II
Mass of the crown (g)	270	300
Volume of the crown (cm^3)	15	15

Using the answer in (c) and the information provided by the table, explain which crown is more likely to be made up of pure gold. (4 marks)

End of Paper