OUNDLE
School

EXAMINATION PAPER
Non-Common Entrance 2024

Science

Time allowed: 1 hour

Name: _____

Instructions

- Write your name clearly in the space above.

- Answer on this paper.

- Calculators are allowed.

- Answer **ALL** the questions **in each** section. Each section carries the same number of marks.

- You are expected to write clearly and accurately throughout each of your answers. You should leave some time towards the end of the examination to check your work carefully.

- The maximum number of marks for this paper is 60.

- Where there is a multiple-choice question, answer by circling the letter you wish to choose. If you change your mind, place a line through it and then circle your new answer.

Section One: Biology

1) Which is the odd one out?
   a) Frog
   b) Newt
   c) Lizard
   d) Toad

2) Which one of the following shows discontinuous variation?
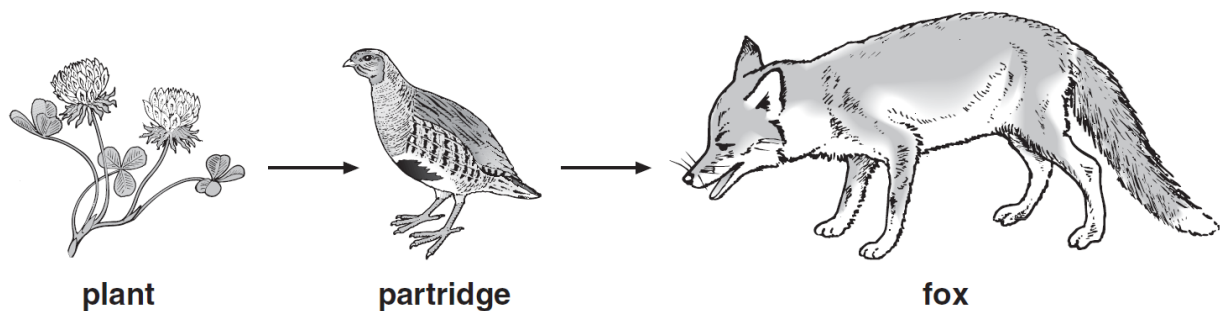   a) Eye colour
   b) Height
   c) Strength
   d) Weight

3) Which of the following is a function of the pancreas?
   a) Absorbs digested food into the blood.
   b) Absorbs water from the gut
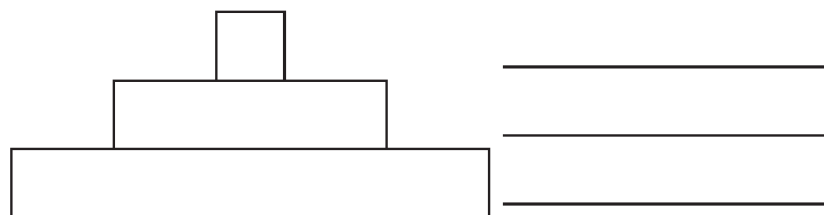   c) Makes bile to break down fats.
   d) Makes enzymes

4) The drawings show part of a farmland food chain.

plant   partridge   fox

not to scale

a) A pyramid of numbers represents the number of organisms at each stage in a food chain.

On each line by the pyramid of numbers below, write the name of the correct organism from the food chain above.

b) Partridges feed mainly on insects and wild plants (weeds).

Some farmers spray their crops with chemicals to kill insects and weeds.

Explain how this would affect the number of foxes.

_____

_____

[2 Marks]

c) Partridges build their nests on the ground among plants.

They lay up to 18 eggs in the nest.

Suggest why partridges need to lay so many eggs.

_____

[1 Mark]

d) Some farmers leave a strip of land around the edge of each field which they do not spray with chemicals.
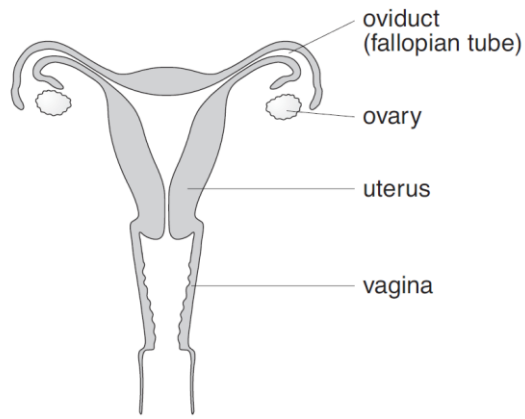
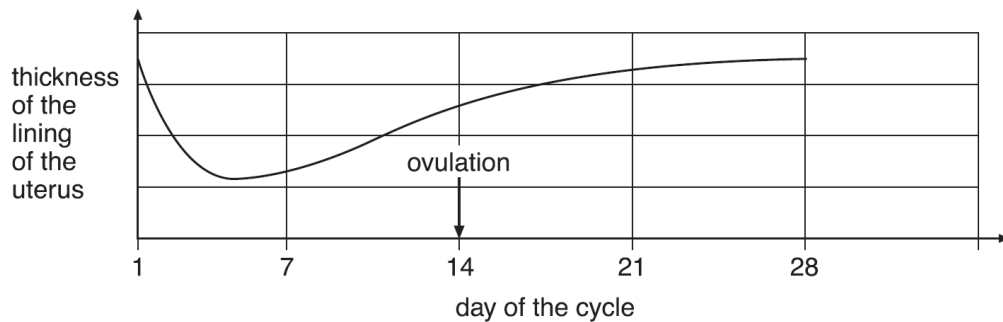Suggest two reasons why this will lead to an increase in the number of partridges on these farms.

_____

_____

[2 Marks]

5) **Diagram 1** shows the female reproductive system.

oviduct
(fallopian tube)

ovary

uterus

vagina

a) **Diagram 2** is a graph showing how the thickness of the uterus changed over a 28-day cycle.

thickness
of the
lining
of the
uterus

ovulation

1   7   14   21   28

day of the cycle

i) Suggest why the thickness of the lining of the uterus decreases between day 1 and day 5 of this cycle.

_____

[1 Mark]

ii) Referring to the graph, suggest which day in this cycle an ovum (egg) is most likely to be fertilised.

_____

[1 Mark]

iii) The graph shows that the lining of the uterus builds up again between day 5 and day 14.

Why is this necessary?

_____

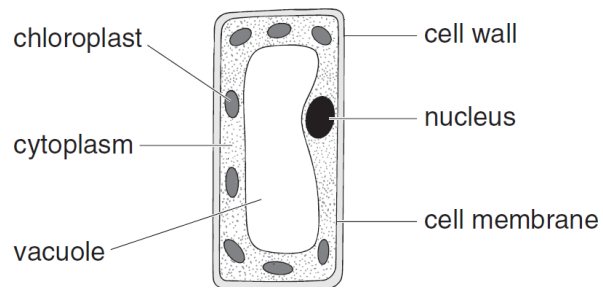*[1 Mark]*

iv) Continue the line on the **diagram 2** to show what would happen to the thickness of the lining of the uterus after 28 days if an ovum was fertilised.

[1 Mark]

4

6) The picture below shows a plant cell.

chloroplast — cell wall
nucleus
cytoplasm — cell membrane
vacuole

a) In which part of a plant would you find this type of cell?

_____

[1 Mark]

b) Give the function of the nucleus.

_____

[1 Mark]

c) Give the function of the chloroplasts.

_____

[1 Mark]

d) Give the function of the cell wall.

_____

[1 Mark]

e) Give the names of two labelled parts that are not present in animal cells.

1) _____

2) _____

[2 Marks]

5

f) Tick one box in each row to show whether the statement is true for photosynthesis or for respiration.

statement	photosynthesis	respiration
carbon dioxide is produced		
light is needed		
it occurs in plants and animals		
oxygen is produced		

[1 Mark]

[Total for section One: 20 marks]

Section Two: Physics

1) On Jupiter, 1kg weighs approximately 25 newtons. What would be the weight of 100g?

   a) 0.25N
   b) 2.5N
   c) 250N
   d) 2500N

   [1 Mark]

2) Which of the following is NOT a touching force?

   a) A push
   b) Air resistance
   c) Friction
   d) Magnetism

   [1 Mark]

3) Friction ....

   a) Doesn't affect a moving object
   b) Slows down a moving object
   c) Speeds up a moving object
   d) Starts a moving object

   [1 Mark]

4) Which of the following statements is true?

   a) A flow of electrons around a circuit is called an electric current
   b) A switch only turns the current off
   c) An open switch allows a small amount of current through it
   d) Two identical bulbs in a series circuit are brighter than one

   [1 Mark]

5) Two identical bulbs are in parallel in a complete circuit. A third identical bulb is connected in parallel. What happens?

   a) All the bulbs are dimmer
   b) All the bulbs are the same brightness
   c) The third bulb is brighter
   d) The third bulb is dimmer

   [1 Mark]

6) Jasper weighs 400 N. He sits on a see-saw 1.5 m from the pivot (centre). Calculate the moment caused by Jasper.

   a) 200Nm
   b) 400Nm
   c) 600Nm
   d) 800Nm

   [1 Mark]

7) If the current in the wire increases, what happens to the strength of the magnetic field?

   a) It decrease
   b) It increases
   c) It stops the magnetic field
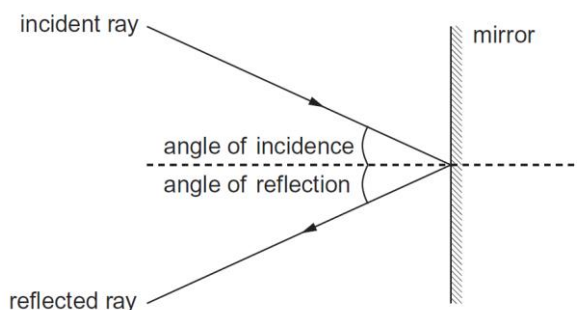   d) No change

<div align="right">*[1 Mark]*</div>

8) What has to happen to the force exerted if the area doubles but the pressure is unchanged?

   a) The force must quadruple
   b) The force must stay the same
   c) The force must double
   d) The force must half

<div align="right">*[1 Mark]*</div>

9) James shone a ray of light at a mirror as shown below in **diagram 3**.

diagram 3

He measured the angle of reflection for different angles of incidence.

His results are shown below.

angle of **incidence** (°)	30	40	50	60	70
angle of **reflection** (°)	30	40	50	65	70

a) Explain which angle of reflection was **not** measured accurately.

_____

_____

<div align="right">*[2 Marks]*</div>
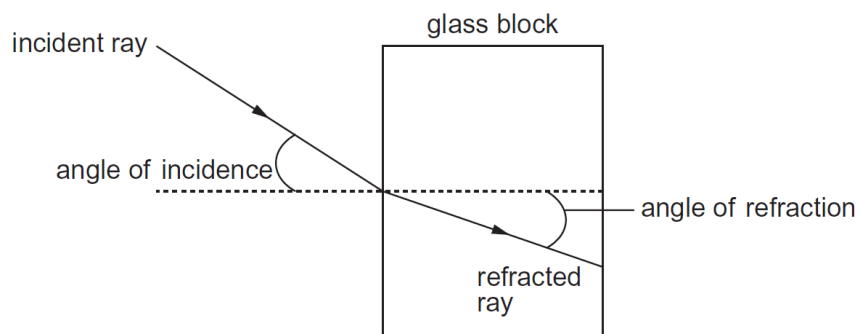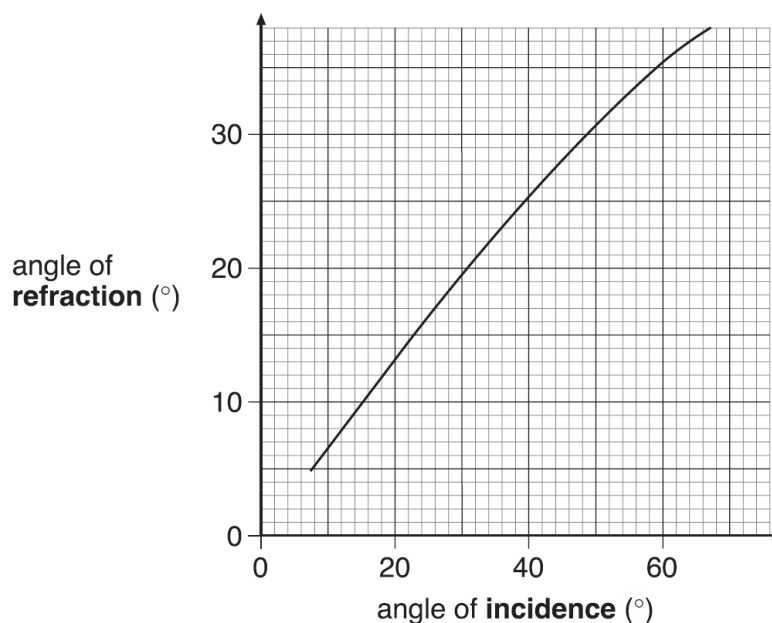
b) James set up a different experiment as shown below in **diagram 4**.

diagram 4

He measured the angle of refraction for different angles of incidence.

His results are shown in the graph.

i) When the angle of **refraction** is 20°, what is the angle of **incidence**?

_____ °

[2 Marks]

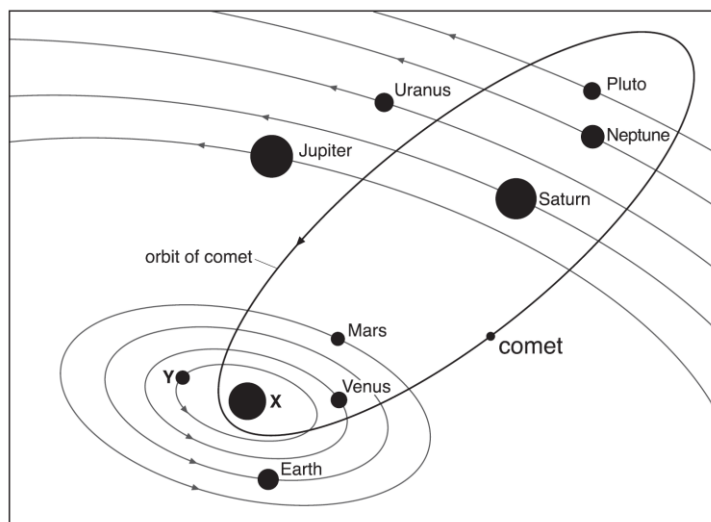ii) Using the data, write a conclusion that links **refraction** and **incidence**.

_____

_____

[2 Marks]

iii) On diagram 4, draw a line to continue the refracted ray as it leaves the glass block

[1 Mark]

9

10) The diagram below shows part of the solar system.

a) What are X and Y?

[1 Mark]

b) In 1531, 1607 and 1683 scientists recorded that they had seen a comet in the sky.

Edmund Halley looked at these dates and suggested the scientists had all seen the same comet.

Explain how he worked out that it was the same comet each time.

[1 Mark]

11) Jupiter has an orbit of 1.56 billion km. It takes 12 years to orbit the earth.

To the nearest thousand, what is the speed of Jupiter's orbit in km/h?

1 billion = 1,000,000,000.

You can assume 1year is 365 days.

Show your working.

_____

_____

_____

_____

_____

[4 Marks]

[Total for Section Two: 20 marks]

Section Three: Chemistry

1) How many atoms of sulfur are there in $CuSO_4$?
   a) One
   b) Two
   c) Three
   d) Four

[1 Mark]

2) Which of the following metals is a liquid at room temperature?
   a) Lithium
   b) Iron
   c) Mercury
   d) Magnesium

[1 Mark]

3) When the elements lead and bromine combine together, the name of the substance formed is called…?
   a) Lead bromate
   b) Lead bromide
   c) Lead bromine
   d) Lead bromium

[1 Mark]

4) Sandstone is grainy and crumbly and may contain fossils. Its rock type is…..
   a) Soft
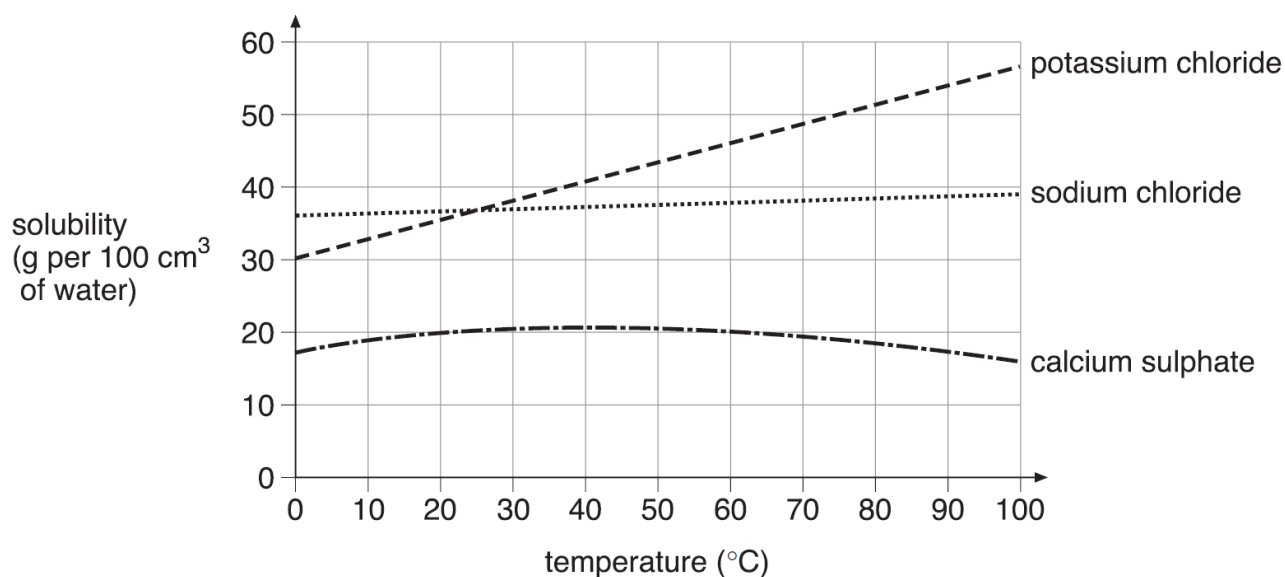   b) Sedimentary
   c) Igneous
   d) Metamorphic

[1 Mark]

5) When a smell spreads, particles move away from where they originated. This is called …….
   a) Condensation
   b) Diffusion
   c) Dispersion
   d) Evaporation

[1 Mark]

6) The graph below shows how the solubility of three salts, sodium chloride, potassium chloride and calcium sulphate, changes as the temperature changes.

a) Use the graph above to compare the solubility of sodium chloride and potassium chloride as the temperature range changes from 10°C to 90°C.

_____

_____

_____

[2 Marks]

b) Martin had a beaker containing 54 g of potassium chloride dissolved in 100 cm³ of water at 90°C.

He cooled the solution to 40°C.

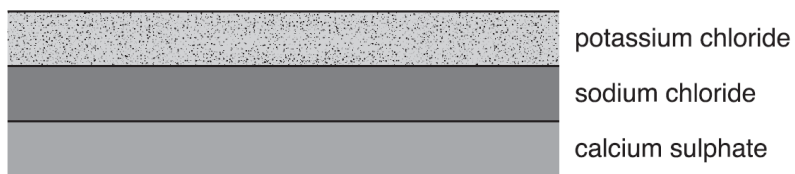Explain what he would see in the beaker as the solution cooled to 40°C?

Use the graph to help you.

_____

_____

[2Marks]

c) The water in a lake had the three salts dissolved in it. The water evaporated from the lake and the salts were deposited in layers in the order shown below.

potassium chloride

sodium chloride

calcium sulphate

(i) What evidence is there that these three salts were deposited at a temperature above 25°C?

_____

[1 Mark]

(ii) In what order would the salts be deposited at 10°C?

Top: _____

Middle: _____

Bottom: _____

[1 Mark]

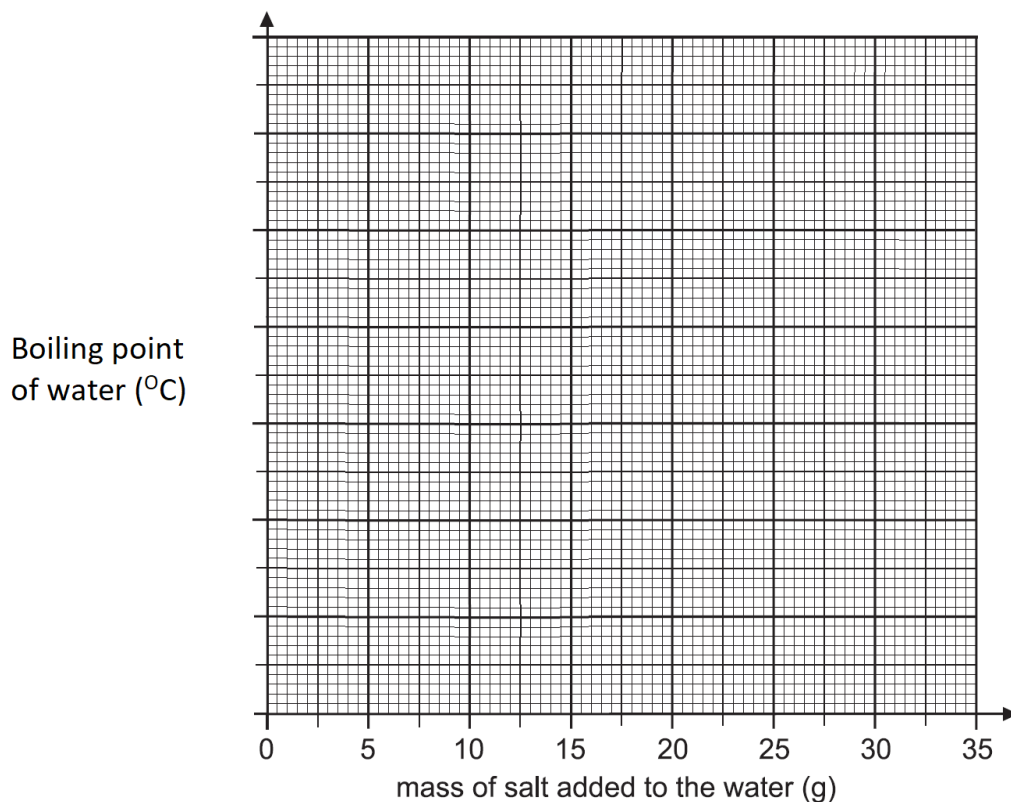7) Eve investigated how adding salt to water affects the boiling point of water.

a) What is the **independent** variable in Eve's investigation?

_____

Her results are shown below:

Mass of salt (g)	Boiling point of water (ºC)
0	100
5	104
10	105
15	108
20	112
25	116
30	120

b) Plot Eve's results on the graph.

[3 Marks]

c) On your graph, circle the point that does not fit the pattern.

[1 Mark]

14

d) Suggest on reason for this result.

_____

_____

[1 Mark]

e) The salt that Eve used was sodium chloride. Sodium chloride has the formula NaCl.

   i)   How many elements are present in sodium chloride?

_____

[1 Mark]

   ii) Sodium chloride is a **compound**. What is meant by the term **compound**?

_____

[1 Mark]

   iii) Sodium chloride can be produced by the reaction of sodium **carbonate** and hydrochloric **acid**. Write a word equation for this reaction.

_____

[1 Mark]

[Total for Section Three: 20 marks]

End of Paper