



77018233



EXAMINATIONS COUNCIL OF ZAMBIA
JUNIOR SECONDARY SCHOOL LEAVING EXAMINATION (GRADE 9) – 2021

Integrated Science 502/1
Paper 1

(INTERNAL CANDIDATES)

Time: 2 hours 30 minutes

Marks: 80

Instructions to Candidates

- 1 Pull out the inserted **Answer Booklet** from the question paper.
- 2 Write your **examination number, school/centre name and code** on the **Answer Sheet**.
- 3 Ensure that you **write** your **examination number** on **every page** of the Answer Booklet.
- 4 This paper consists of two Sections **A** and **B**. Answer **all** the questions in both sections of this paper.
- 5 Section **A**: for each question, **four** suggested answers **A, B, C** and **D** are given. Choose the best one and mark it on the answer grid provided in the Answer Booklet.
- 6 Section **B**: write all the answers in the spaces provided for section **B** in the Answer Booklet.
- 7 Hand in the Answer Booklet and the rest of the question paper separately.

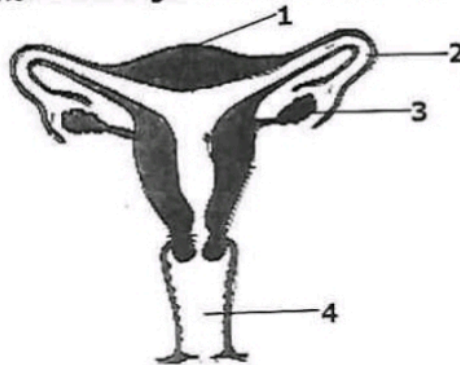
Information for Candidates

- 1 Cell phones are **not allowed** in the examination room.
- 2 Calculators are **not allowed** in the examination room.

SECTION A (20 Marks)

Answer **all** questions. Mark your answers with a **cross (X)** on the Answer Grid provided in the Answer Booklet.

- 1 Which of the following is **not** a way of observing personal hygiene of the reproductive organs in both males and females?
 - A Changing sanitary towels regularly during menstruation.
 - B Changing underwear regularly and ironing them before use.
 - C Visiting the health centre each time there is an infection on the reproductive organs.
 - D Washing of the reproductive organs to avoid bad smell.
- 2 The following diagram shows the organs in the female reproductive system.



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Which numbered part shows the organ where the process of implantation of the zygote occurs?

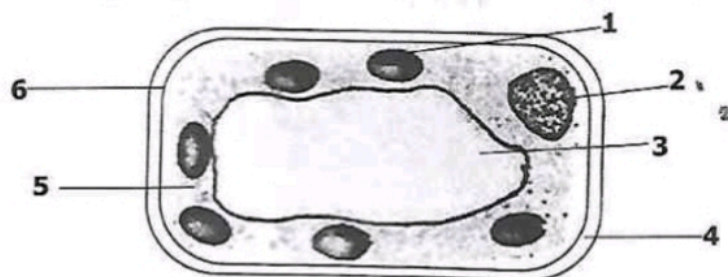
- A 1
 - B 2
 - C 3
 - D 4
- 3 The following table shows symptoms and nutritional deficiency diseases.

	Symptom	Nutritional deficiency disease
1	Poor vision at night	Kwashiorkor
2	Swollen stomach and thin limbs	Marasmus
3	Poor healing of wounds	Rickets
4	Unhealthy bones and teeth	Scurvy

Which pair correctly shows the symptom and corresponding nutritional deficiency disease?

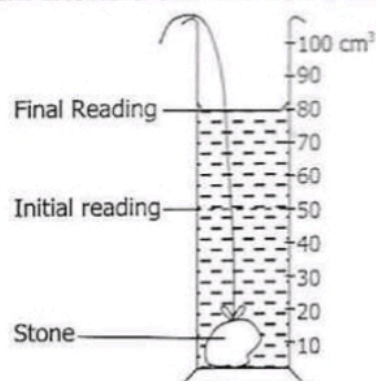
- A 1
- B 2
- C 3
- D 4

- 4 Which of the following is a natural cause of air pollution?
- A Chimney emissions from manufacturing industries. <
- B Dust from road construction sites. <
- C Exhaust gases from motor cars. ✓
- D Volcanic gases during an eruption.
- 5 The following diagram shows the structures in a plant cell.



Which structures are found in both animal and plant cells?

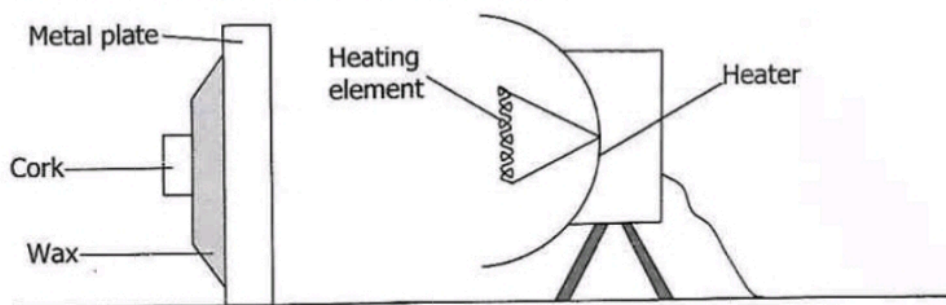
- A 1, 2 and 3
- B 1, 3 and 4
- C 2, 5 and 6
- D 4, 5 and 6
- 6 Which of the following shows the nutritional deficiency symptoms in a plant lacking potassium? The plant will have ...
- A leaves that will turn dark green and then purple.
- B leaves that will have yellow or brown edges and eventually die.
- C poorly developed root system.
- D slow, stunted growth and yellow leaves.
- 7 The diagram shows a stone of mass 90g in a measuring cylinder containing water.



What is the density of the stone?

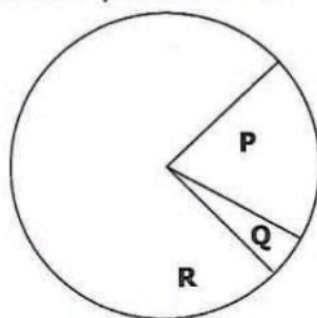
- A 0.8g/cm^3
- B 3g/cm^3
- C 30g/cm^3
- D 50g/cm^3

- 8 A small cork is fixed with wax to a metal plate placed close to an electric heater which is switched on as shown in the diagram.



How does the heat reach the wax? By ...

- A conduction and radiation.
 - B conduction only.
 - C convection and radiation.
 - D radiation only.
- 9 Which of the following is correct about the characteristics of an image formed by a plane mirror? The image is ...
- A real and bigger than the object.
 - B real and upright.
 - C virtual and same size as object.
 - D virtual and upright.
- 10 The pie chart shows composition of air.

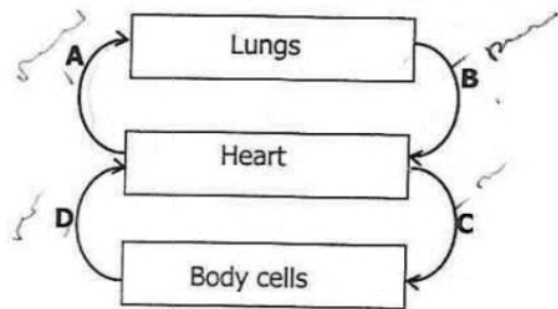


Composition of air

Which of the following is correct about the composition of air?

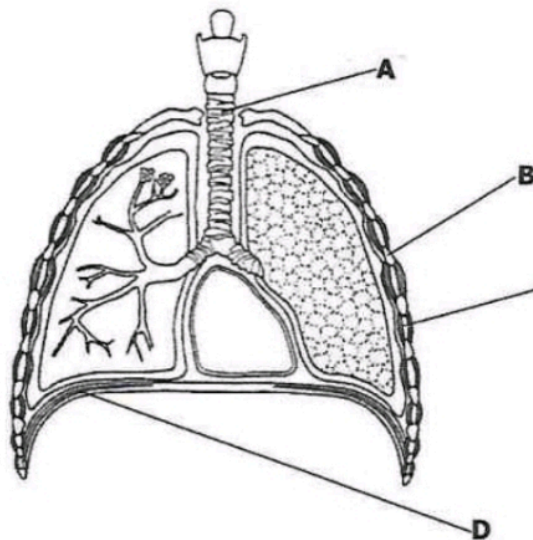
	Oxygen	Nitrogen	Carbon dioxide and other gases
A	P	R	Q
B	P	Q	R
C	Q	P	R
D	R	Q	P

- 11 The following diagram shows dual blood circulatory system in human beings.



Which of the labelled parts **A**, **B**, **C** or **D** shows an artery carrying oxygenated blood?

- 12 The diagram shows part of the human respiratory system.



Identify the organ called diaphragm.

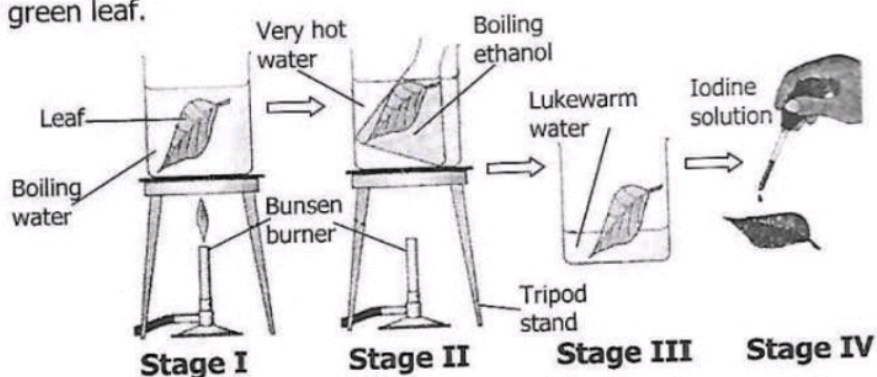
- 13 Which of the following STIs can be transmitted through kissing?

- A Genital warts
- B Gonorrhoea
- C HIV and AIDS⁺
- D Syphilis

- 14 Which of the following processes does **not** take place at a water purification plant?
Removal of ...

- A biological contaminants. ✓
- B chlorine. ✓
- C suspended solids.
- D undesirable chemicals.

- 15 The following diagram shows the stages of an experiment on starch test in a green leaf.

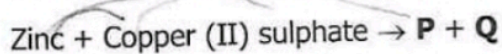


What will be the colour of the leaf after stage II of the experiment?

- A Blue
 - B Blue-black
 - C Green
 - D White
- 16 A learner treated four identical leaves as follows:
- Leaf 1: Petroleum jelly was applied to both lower and upper surfaces
 - Leaf 2: Petroleum jelly was applied only to the lower surface
 - Leaf 3: Petroleum jelly was applied only to the upper surface
 - Leaf 4: Was left untreated (without applying petroleum jelly).

Which leaf will stay fresh for a long time?

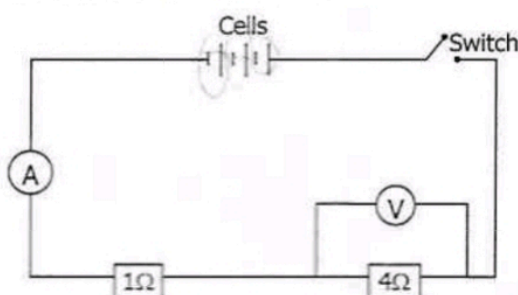
- A 1
 - B 2
 - C 3
 - D 4
- 17 In a chemical reaction, Zinc and Copper (II) sulphate solution react to form substance **P** and **Q** as shown in the following incomplete word equation:



What do the letters **P** and **Q** stand for in the word equation?

	P	Q
A	Copper	Zinc
B	Copper	Sulphate
C	Zinc	Sulphate
D	Zinc Sulphate	Copper

- 18** The following diagram shows an electric circuit with cells of 2 volts each connected to two resistors (1Ω and 4Ω).



What will be the reading of **V** in the circuit?

- A** 1.2V
B 1.5V
C 4.8V
D 5.0V
- 19** Which equation correctly states the formula that can be used to calculate pressure?
- A** Pressure = Force $\times$ Distance
B Pressure = Force $\times$ Area
C Pressure = $\frac{\text{Force}}{\text{Area}}$
D Pressure = $\frac{\text{Force}}{\text{Distance}}$
- 20** A geostationary satellite is one which ...
- A** is stationed on earth as it transmits information.
B moves beyond the earth exploring the space.
C moves so as to remain in the same area above the earth.
D orbits in the atmosphere as it receives information.

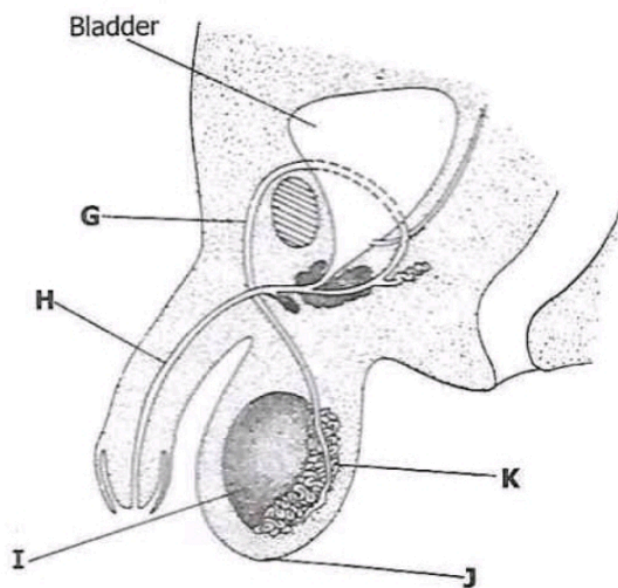
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SECTION B (60 Marks)

Write all the answers in the spaces provided in the Answer Booklet.

1 THE HUMAN BODY

The following diagram shows the male reproductive system.



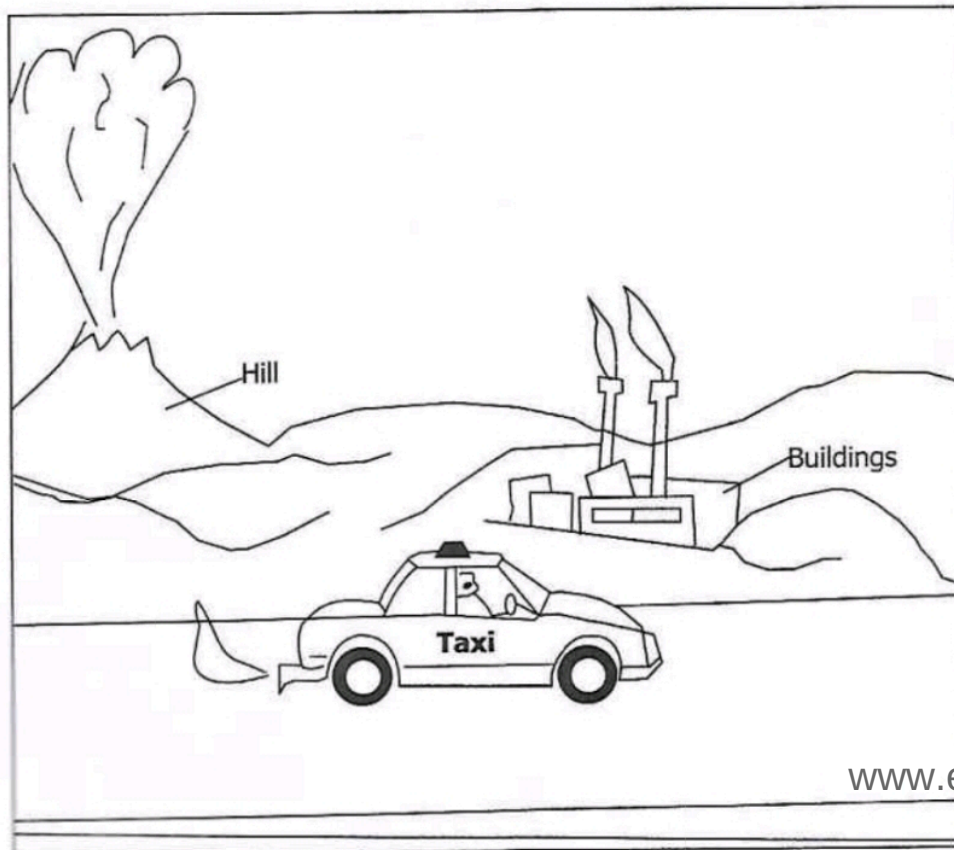
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- (a) Identify the parts labelled **H** and **J**. [2]
- (b) Apart from sperms, which other substance passes through organ **G**? [1]
- (c) State the functions of
- (i) organ **K**, [1]
 - (ii) the substance produced by organ **I**. [1]
- (d) Give **one** reason why it is important to observe personal hygiene of the reproductive organs. [1]

Total: 6 marks

2 THE ENVIRONMENT

The following picture shows natural and human activities in the environment.



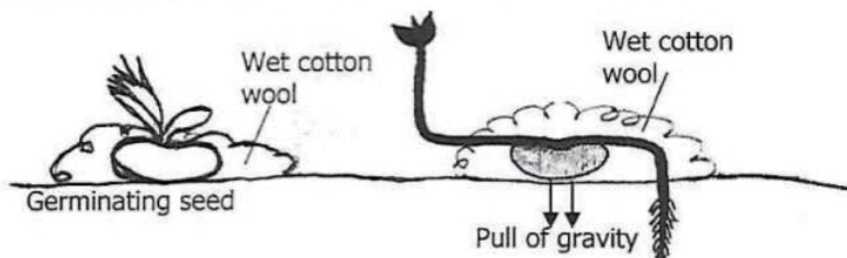
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- (a) Name the type of pollution illustrated in the picture. [1]
- (b) From the picture, identify a source of pollution caused by a
- (i) natural event, [1]
 - (ii) human activity. [1]
- (c) Mention **one** pollutant that would be produced from the human activities in the picture. [1]
- (d) Explain the effects of the type of pollution named in question (a) above on
- (i) buildings,
 - (ii) living organisms. [2]

Total: 6 marks

3 PLANTS AND ANIMALS

The following diagrams show an experiment on an investigation of the effects of gravity on parts of a plant using a germinating seed. After a few days the germinating seed showed some changes as shown.



Beginning of Experiment

End of Experiment

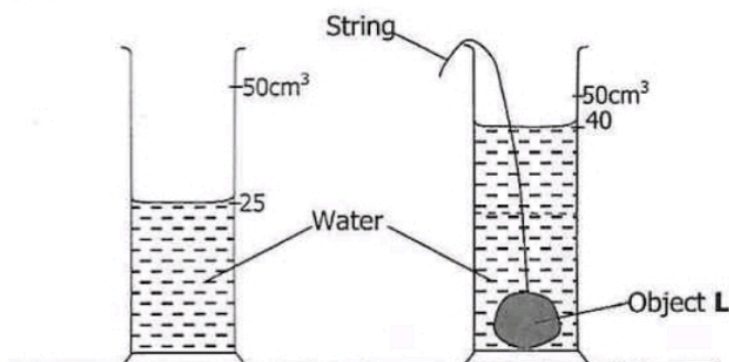
- (a) State the type of response shown by the
- (i) shoot, [1]
 - (ii) root. [1]
- (b) Explain why the shoot grew vertically after a few days. [1]
- (c) Give **two** advantages of the response shown by the root. [2]
- (d) Mention **one** major element important for plant growth. [1]

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Total: 6 marks

4 MATERIALS AND ENERGY

The following diagram shows an experiment used to determine the volume of object L.

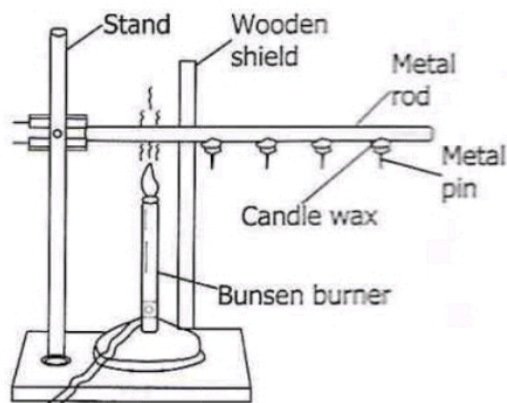


- (a) What is the volume of the water used in the experiment? [1]
- (b) Calculate the
- (i) volume of object L, [1]
 - (ii) density of object L, if its mass is 30g. (Show your working) [2]
- (c) Write **two** precautions to be considered when carrying out such an experiment. [2]

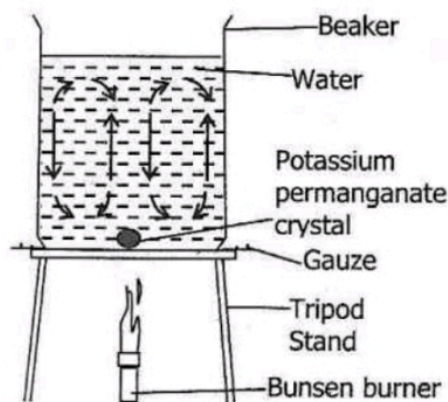
Total: 6 marks

5 MATERIALS AND ENERGY

The following diagrams show two experiments used to demonstrate different types of heat transfer.



Experiment I



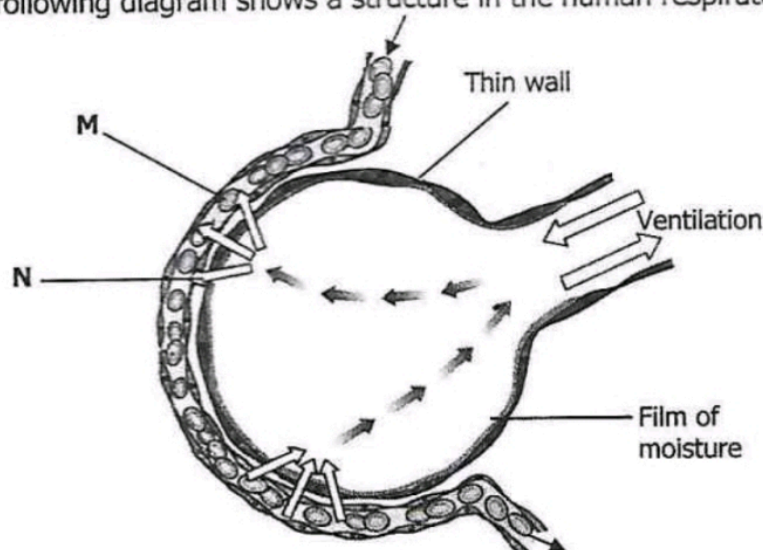
Experiment II

- (a) What type of heat transfer is being demonstrated in
- experiment I, [1]
 - experiment II? [1]
- (b) What will happen to the candle wax and the metal pins in experiment I after some time? [1]
- (c) Explain the purpose of the potassium crystal in experiment II. [1]
- (d) What would happen to the candle wax if the metal rod is replaced by a glass rod and the experiment is repeated? [1]
- (e) Why was the wooden shield placed between the Bunsen flame and the candle wax and pin in experiment I? [1]

Total: 6 marks

6 THE HUMAN BODY

The following diagram shows a structure in the human respiratory system.



- What is the name of the structure shown in the diagram? [1]
- Identify the parts labelled
 - M, [2]
 - N. [1]
- What is the function of the part labelled M? [1]
- By what process are gases exchanged in the structure shown in the diagram? [1]
- Explain **one** effect of tobacco and cigarette smoking on the structure shown in the diagram. [1]

Total: 6 marks

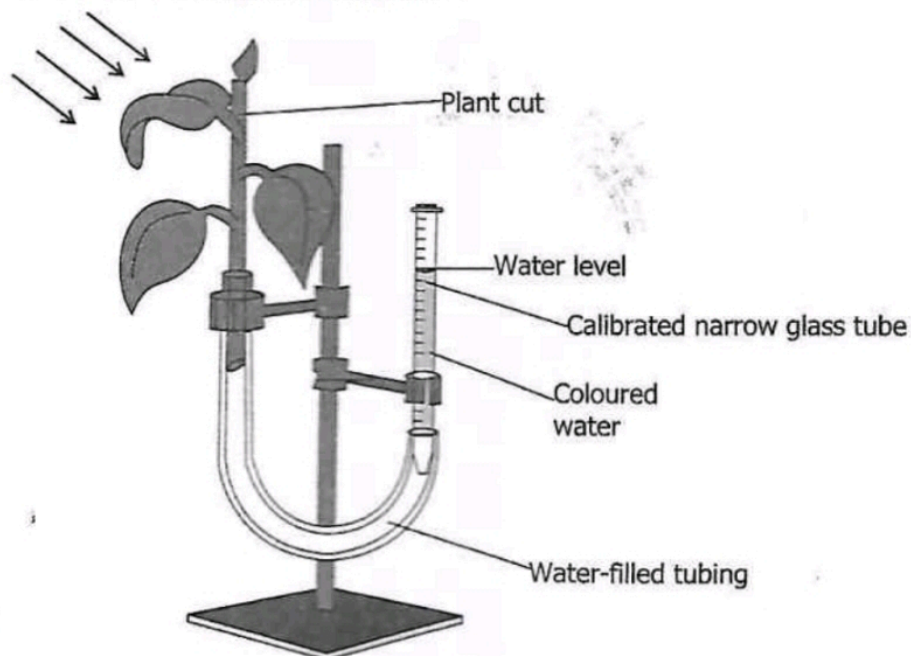
7 HEALTH

- State **one** common Sexually Transmitted Infection (STI) that is caused by a bacteria in human beings. [1]
- What is the name of the virus that causes the Acquired Immuno Deficiency Syndrome (AIDS)? [1]
- Apart from AIDS, what other STI is caused by a virus? [1]
- Mention the Sexually Transmitted Infection that causes blindness in unborn babies if not treated early. [1]
- Describe **one** way of preventing the contraction of STIs and AIDS. [1]
- Explain the negative effect of HIV and AIDS on the health services of a population. [1]

Total: 6 marks

8 PLANTS AND ANIMALS

The following diagram shows the apparatus set up to investigate factors that affect the rate of transpiration in plants.

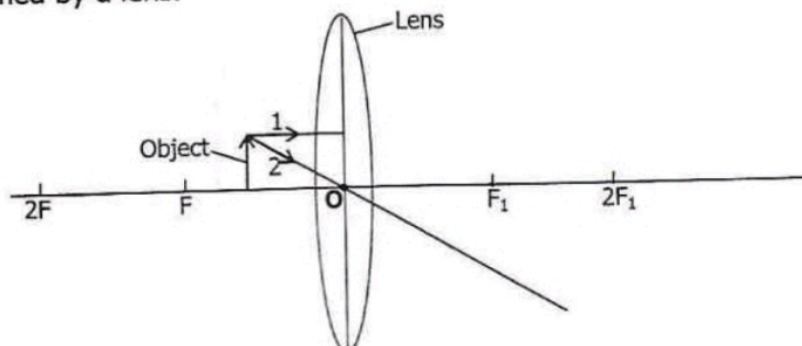


- (a) What name is given to an apparatus shown in the diagram? [1] www.eczpastpapers.com
- (b) What would happen to the rate of movement of the coloured water level in the narrow glass tube if the apparatus is moved to a place with very bright light? [1]
- (c) Apart from light, state **one** other physical factor in the environment that affects the rate of transpiration. [1]
- (d) State **one** biological factor that affects the rate of transpiration. [1]
- (e) Why is coloured water used in the apparatus? [1]
- (f) Why is transpiration important in plants? [1]

Total: 6 marks

9 MATERIALS AND ENERGY

The following diagram shows the apparatus set up to determine the image formed by a lens.

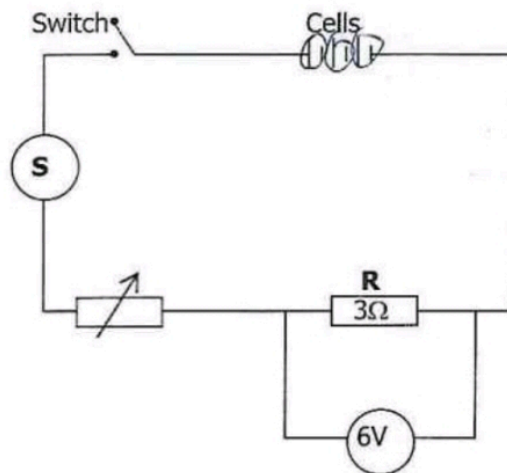


- (a) What type of lens is used in the ray diagram? [1]
- (b) Identify the position labelled **O** in the diagram. [1]
- (c) Complete the construction of the ray diagram to locate the position of the image. [1]
- (d) Describe the nature of the image formed. [1]
- (e) Which optical instrument uses such a lens to obtain the type of image formed in (c)? [1]
- (f) What is the name of a glass or plastic shaped piece that can be used to disperse white light into different colours of light? [1]

Total: 6 marks

10 MATERIALS AND ENERGY

The electric circuit diagram shows cells connected to a resistor **R** in an experiment.



- (a) Define voltage in the electric circuit. [1]
- (b) Identify the instrument labelled **S** in the circuit. [1]
- (c) How many cells are shown in the circuit diagram? [1]
- (d) Calculate and state the meter reading at instrument **S** in the circuit diagram when the switch is closed. [1]
- (e) What would happen to the meter reading at **S** if the voltage in the circuit is doubled and the resistance **R** remains the same at 3Ω ? [1]
- (f) What does the result in the meter reading at **S** in (e) show about the relationship between voltage and current? [1]

Total: 6 marks

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