

# EXAMINATIONS COUNCIL OF ZAMBIA

Examination for General Certificate of Education Ordinary Level

## Biology

5090/1

### Paper 1 Multiple Choice

Tuesday

25 JULY 2017

**Additional Materials:**

- Multiple Choice answer sheet
- Soft clean eraser
- Soft pencil (type B or HB is recommended)

**Time 50 minutes**

#### Instructions to Candidates

**Do not open this Question Paper until you are told to do so.**

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Write your **name**, **centre number** and **candidate number** on the Answer Sheet in the spaces provided unless this has already been done for you.

There are **forty** questions in this paper. Answer all questions. For each question 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 Answer Sheet.

**Read very carefully the instructions on the Answer Sheet.**

#### Information for Candidates

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 Question Paper.

**Cell phones are not allowed in the examination room.**

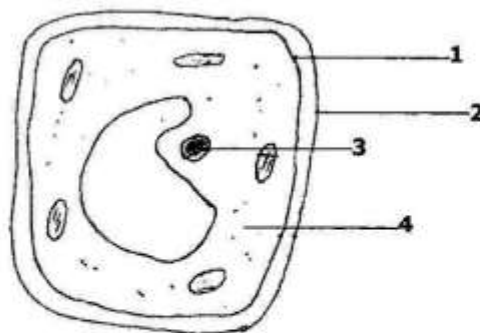
- 1** The diagram shows a guava leaf with a magnification of  $\times 2.0$ .



If the length of the drawing is 8.0 cm, what is the length of the actual leaf?

- A** 4.0 cm
- B** 7.5 cm
- C** 8.5 cm
- D** 16.0 cm

- 2** The diagram shows a plant cell.

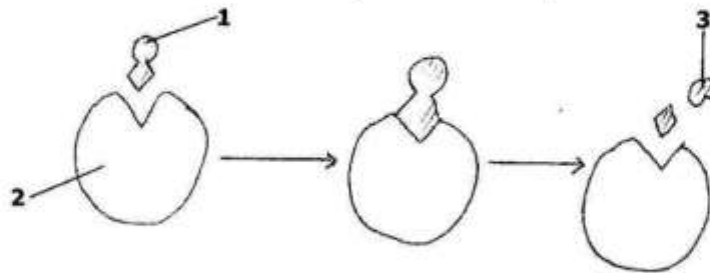


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Which two structures in this cell are not present in a red blood cell?

- A** 1 and 2
  - B** 2 and 3
  - C** 3 and 4
  - D** 2 and 4
- 3** What term is used to refer to a solution outside a cell whose concentration is lower than the concentration of a solution inside the living cell?
- A** Equilibrium
  - B** Hypertonic
  - C** Hypotonic
  - D** Isotonic

- 4 The diagram shows the lock and key model of enzyme action.



Which number in the diagram represents the enzyme and the substrate?

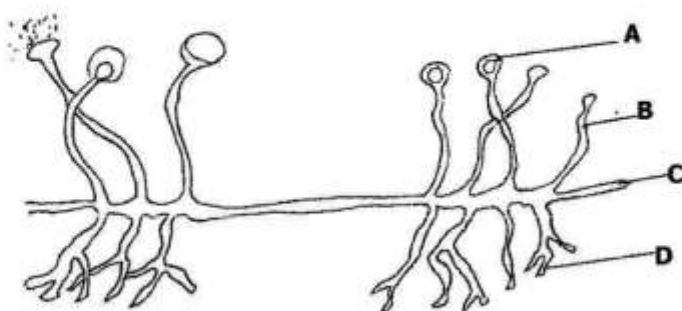
|   | Enzyme | Substrate |
|---|--------|-----------|
| A | 1      | 2         |
| B | 1      | 3         |
| C | 2      | 1         |
| D | 3      | 2         |

- 5 Which of the following correctly shows the deficiency diseases caused by lack of vitamin C, proteins and iron in the body?

|   | Vitamin C   | Protein     | Iron        |
|---|-------------|-------------|-------------|
| A | Anaemia     | Rickets     | Scurvy      |
| B | Kwashiorkor | Anaemia     | Rickets     |
| C | Rickets     | Scurvy      | Kwashiorkor |
| D | Scurvy      | Kwashiorkor | Anaemia     |

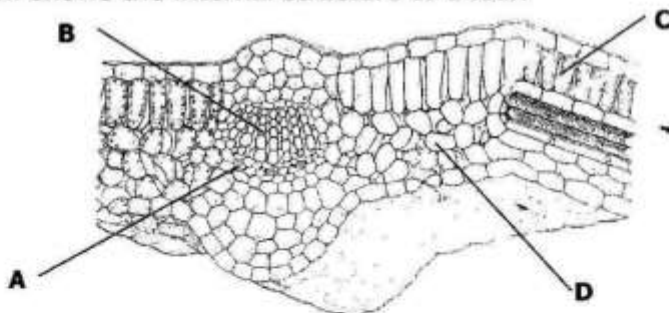
- 6 Which nutrient in the diet should be increased to keep a patient healthy after suffering from malaria for a long time?
- A Calcium  
B fat  
C Iron  
D Vitamin D
- 7 In plants, magnesium is an essential element for formation of ...
- A chlorophyll.  
B flowers.  
C proteins.  
D roots.

- 8 The diagram shows the structure of Rhizopus.



Which labelled part releases digestive enzymes?

- 9 The diagram shows the internal structure of a leaf.

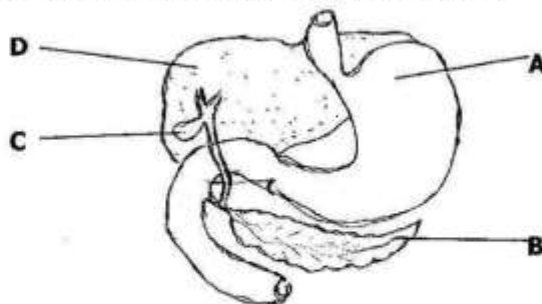


Which part transports food nutrients?

- 10 An organism has the following number of teeth in the mouth. Incisors – 4, canines – 8, premolars – 10 and molars – 12.  
What is the dental formula of the organism?

- A  $i:\frac{2}{2}, c:\frac{4}{4}, pm:\frac{5}{5}, m:\frac{6}{6}$   
 B  $i:\frac{1}{3}, c:\frac{3}{5}, pm:\frac{3}{7}, m:\frac{5}{7}$   
 C  $i:\frac{2}{3}, c:\frac{1}{4}, pm:\frac{5}{5}, m:\frac{7}{5}$   
 D  $i:\frac{1}{1}, c:\frac{2}{2}, pm:\frac{2}{3}, m:\frac{3}{3}$

- 11 The diagram below shows part of the digestive tract.



Which structure produces an alkaline juice needed in digestion?

- 12** What changes cause expiration (breathing out) to take place?

|          | <b>Diaphragm muscle</b> | <b>Internal intercostal muscle</b> | <b>Volume of thorax</b> |
|----------|-------------------------|------------------------------------|-------------------------|
| <b>A</b> | Contracts               | Relaxes                            | Increases               |
| <b>B</b> | Contracts               | Contracts                          | Decreases               |
| <b>C</b> | Relaxes                 | Relaxes                            | Increases               |
| <b>D</b> | Relaxes                 | Contracts                          | decreases               |

- 13** Which of the following can help to reduce the causes of stigma to people living with HIV and AIDS?

- A** Fear
- B** Myths
- C** Counselling and testing
- D** Sensitization

- 14** What type of immunity do babies obtain from the mother through breast milk?

- A** Artificial active immunity.
- B** Artificial passive immunity.
- C** Natural active immunity.
- D** Natural passive immunity.

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- 15** In an experiment to compare water loss, four similar leaves were treated with petroleum jelly (Vaseline) and left on a table for one hour.

**Leaf 1** Upper surface only covered.

**Leaf 2** Lower surface only covered.

**Leaf 3** Both surfaces covered.

**Leaf 4** Neither surface covered.

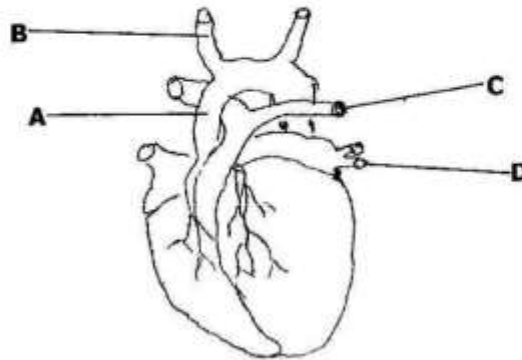
Which of the leaves will wilt the slowest?

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

- 16** Which vitamin is essential for clotting of blood?

- A** Vitamin A
- B** Vitamin B
- C** Vitamin C
- D** Vitamin K

- 17 The diagram shows the external view of the heart.



Which blood vessel is the pulmonary vein?

- 18 Which substance cannot diffuse out of the blood into the dialysis fluid through the dialysis membrane in a kidney machine?

- A Glucose
- B Protein
- C Sodium
- D Urea

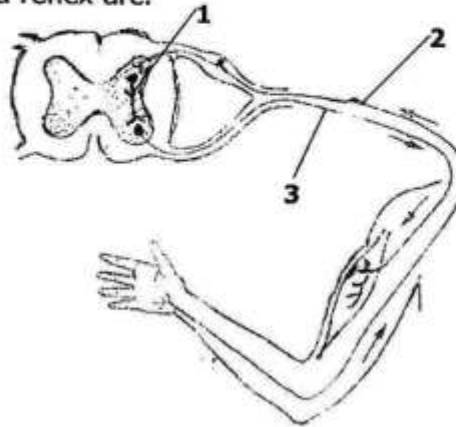
- 19 A person is digging on a hot day without drinking any water. What effect will this have on the release of antidiuretic hormone (ADH) and the reabsorption of water in the body?

|   | Release of ADH | Reabsorption of water |
|---|----------------|-----------------------|
| A | Decreases      | Decreases             |
| B | Decreases      | Increases             |
| C | Increases      | Decreases             |
| D | Increases      | Increases             |

- 20 Which of the following is one of the effects of over production of thyroxine?

- A Cretinism
- B Giantism
- C Hyperactivity
- D Myxoedema

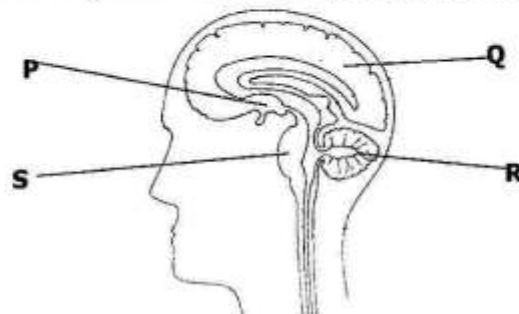
- 21 The diagram shows a reflex arc.



What are the numbered neurones called?

|   | 1     | 2       | 3       |
|---|-------|---------|---------|
| A | Relay | Sensory | Motor   |
| B | Relay | Motor   | Sensory |
| C | Motor | Sensory | Relay   |
| D | Motor | Relay   | Sensory |

- 22 The diagram shows a longitudinal section of the human brain.

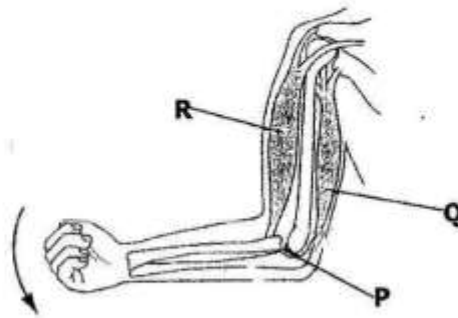


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Which of the labelled part is responsible for controlling heart rate, reasoning and temperature?

|   | Heart rate | Reasoning | Temperature |
|---|------------|-----------|-------------|
| A | P          | Q         | S           |
| B | Q          | R         | P           |
| C | R          | S         | Q           |
| D | S          | Q         | P           |

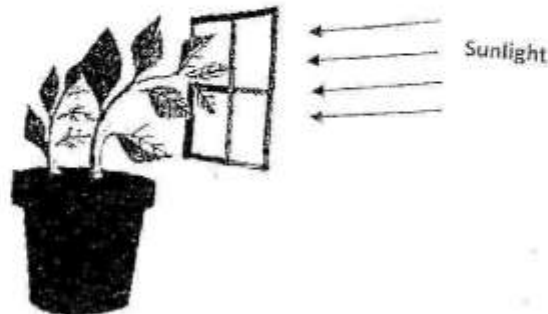
- 23 The diagram shows bones and muscles of the forelimb.



Which of the following correctly identifies joint **P** and what happens to muscle **Q** and **R** when the arm is straightened?

|          | Joint <b>P</b>  | Muscle <b>Q</b> | Muscle <b>R</b> |
|----------|-----------------|-----------------|-----------------|
| <b>A</b> | Ball and socket | Contract        | Relax           |
| <b>B</b> | Ball and socket | Relax           | Contract        |
| <b>C</b> | Hinge           | Contract        | Relax           |
| <b>D</b> | Hinge           | Relax           | Contract        |

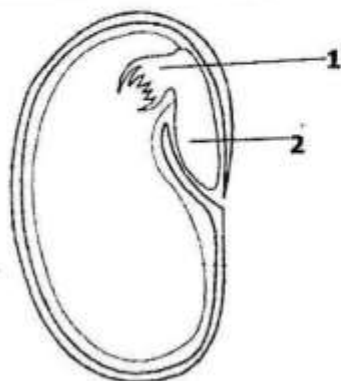
- 24 The diagram shows plant shoots growing towards a stimulus.



What type of tropic response is illustrated in the diagram?

- A** Positive geotropism
- B** Positive phototropism
- C** Negative phototropism
- D** Negative geotropism

- 25 The diagram shows a longitudinal section of a seed.



What are the numbered parts?

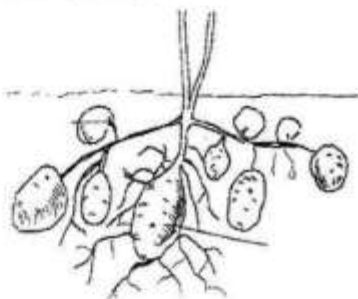
|   | 1         | 2         |
|---|-----------|-----------|
| A | Cotyledon | Plumule   |
| B | Plumule   | Radicle   |
| C | Radicle   | Plumule   |
| D | Plumule   | Cotyledon |

- 26 What type of asexual reproduction occurs in Rhizopus?

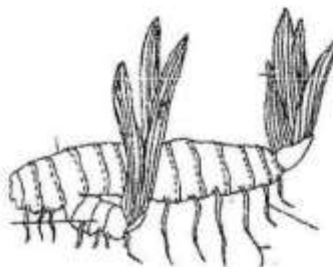
- A Binary fission  
B Budding  
C Fragmentation  
D Spore formation

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- 27 Identify the type of natural vegetative reproduction illustrated by each of the following diagrams.



X



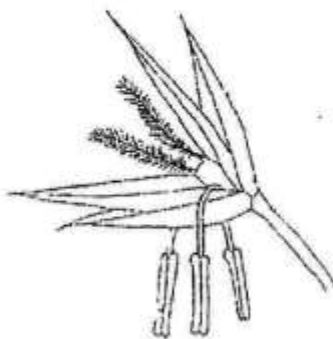
Y



Z

|   | X       | Y       | Z       |
|---|---------|---------|---------|
| A | Tuber   | Bulb    | Rhizome |
| B | Tuber   | Rhizome | Bulb    |
| C | Rhizome | Tuber   | Bulb    |
| D | Tuber   | Bulb    | Stolon  |

28 Which feature in the flower below shows that it is wind pollinated?



- A Lobed stigma
- B Long filaments
- C Presence of petals
- D Short filaments

29 The diagram shows four different fruits.



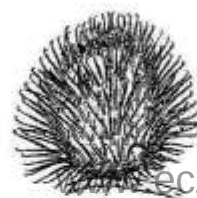
1



2



3



4

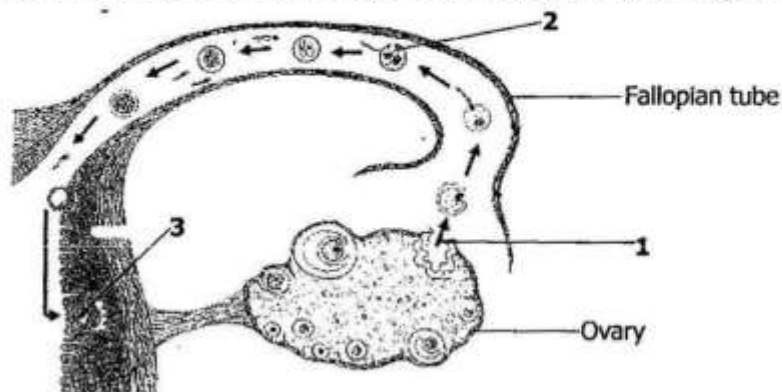
Which **two** fruits are dispersed by animals?

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

30 Which of the following correctly states the functions of the cowper's gland, prostate gland and seminal vesicle in a male reproductive system?

|   | Cowper's gland                   | Prostate gland                   | Seminal vesicle                  |
|---|----------------------------------|----------------------------------|----------------------------------|
| A | Provides lubrication             | Activates sperms                 | Provides nutrients to the sperms |
| B | Provides lubrication             | Provides nutrients to the sperms | Activates sperms                 |
| C | Provides nutrients to the sperms | Provides lubrication             | Activates sperms                 |
| D | Provides nutrients to the sperms | Activates sperms                 | Produces lubrication             |

- 31 The diagram shows part of a human female reproductive system after copulation.

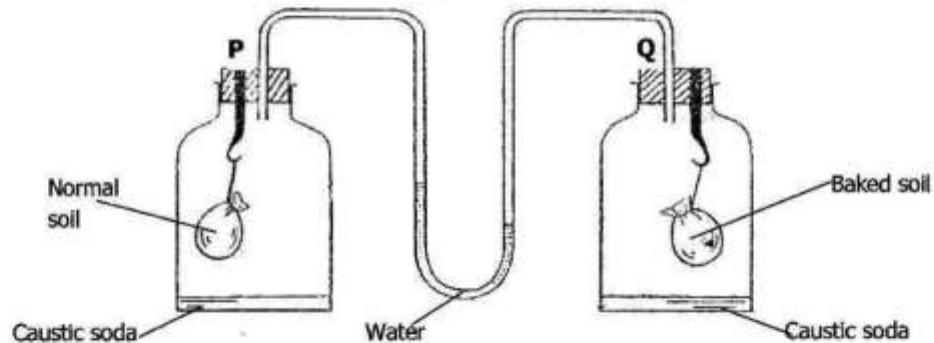


What processes are taking place at points 1, 2 and 3?

|   | 1             | 2             | 3             |
|---|---------------|---------------|---------------|
| A | Fertilisation | Implantation  | Ovulation     |
| B | Fertilisation | Ovulation     | Implantation  |
| C | Ovulation     | Fertilisation | Implantation  |
| D | Ovulation     | Implantation  | Fertilisation |

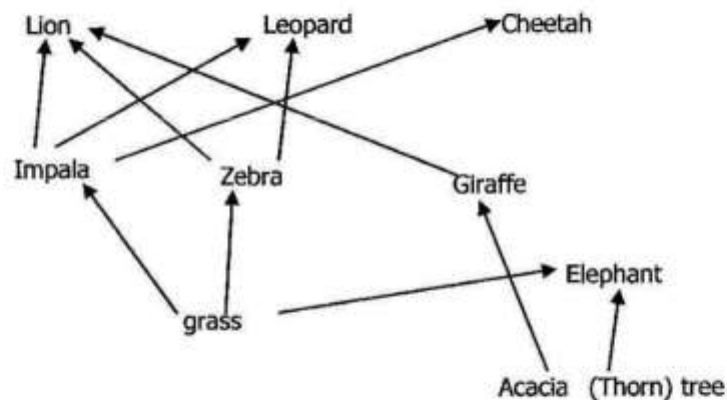
- 32 Vasectomy is one of the methods of preventing pregnancy. Which structure in the male reproductive system is cut during vasectomy?
- A Epididymis  
B Prostate gland  
C Sperm duct  
D Urethra
- 33 Which statement correctly describes events which take place during interphase of mitosis?
- A Chromosomes start to coil, become shorter and thicker.  
B Chromosomes line up on the equator of the spindle.  
C Chromatids are pulled apart by spindle fibres.  
D Chromosomes are replicated ready for the next division.
- 34 In horses, red hair is dominant over brown hair. A breeder crosses a number of heterozygous red-haired horses. What percentage of the offspring will be red-haired?
- A 25%  
B 50%  
C 75%  
D 100%

- 35 Which of the following diseases is caused by chromosomal mutation?
- A Colour blindness
  - B Down's syndrome
  - C Haemophilia
  - D Sickle cell anaemia
- 36 The diagram shows an experimental set up to investigate one of the components of soil. The water level in the U-shaped tube moves up towards P.



What component of soil is being investigated in the experiment above?

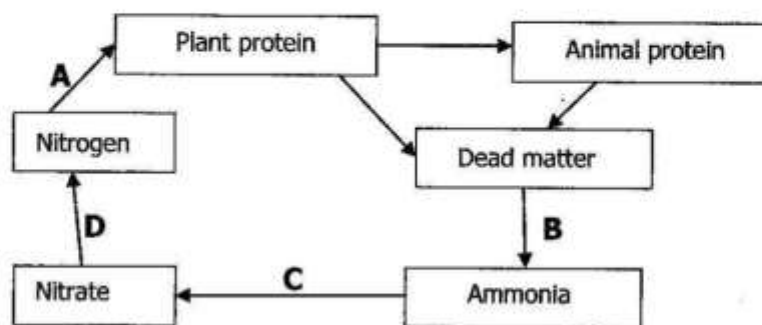
- A Air
  - B Humus
  - C Micro-organisms
  - D Moisture
- 37 The diagram shows feeding relationships of organisms in an ecosystem.



Which organisms in the food web are herbivores?

- A Impala, Zebra, Giraffe, Elephant
- B Impala, Zebra, Giraffe, Leopard
- C Zebra, Giraffe, Leopard, Cheetah
- D Zebra, Lion, Leopard, Cheetah

- 38 The diagram shows part of the nitrogen cycle.



At which point are nitrifying bacteria involved?

- 39 What changes in the concentration of oxygen, number of fish and number of bacteria would occur when sewage is discharged into a river?

|   | Concentration of oxygen | Number of bacteria | Number of fish |
|---|-------------------------|--------------------|----------------|
| A | Decreases               | Decreases          | Increases      |
| B | Decreases               | Increases          | Decreases      |
| C | Increases               | Decreases          | Decreases      |
| D | Increases               | Increases          | Increases      |

- 40 Which of the following human activities help increase bio-diversity of organisms?

- A Afforestation
- B Charcoal production
- C Fishing
- D Hunting

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