

# 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.**

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.**

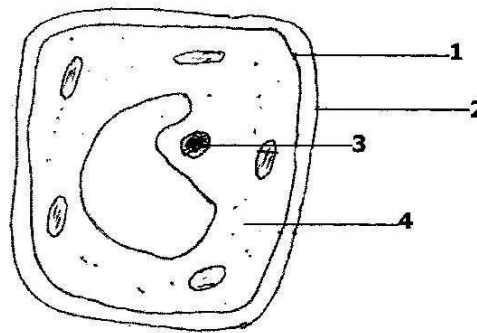
- 1** The diagram shows a guava leaf with a magnification of x2.0.



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

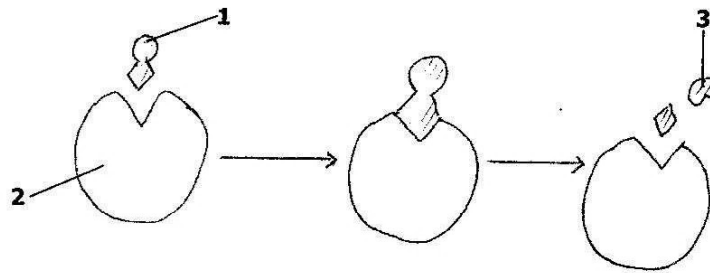
- 2** The diagram shows a plant cell.



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?

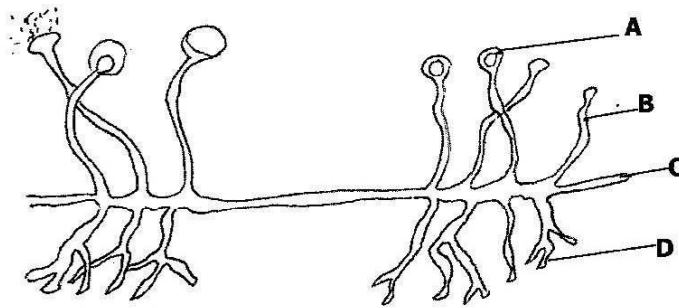
	Enzyme	Substrate
A	1	2
B	1	3
C	2	1
D	3	2

- 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

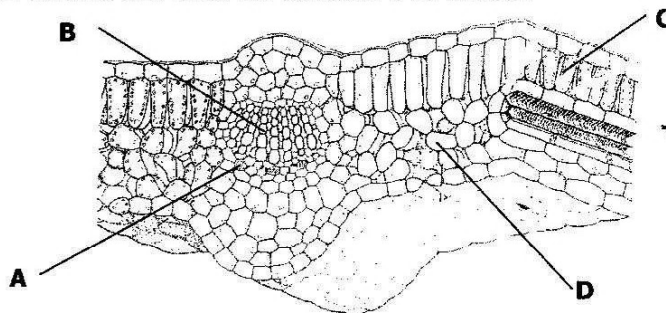
- 6 Which nutrient in the diet should be increased to keep a patient healthy after suffering from malaria for a long time?
- A Calcium
  - B fat
  - C Iron
  - D Vitamin D
- 7 In plants, magnesium is an essential element for formation of ...
- A chlorophyll.
  - B flowers.
  - C proteins.
  - D roots.

- 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?

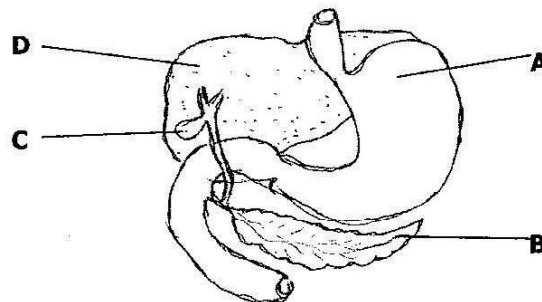
A  $i:\frac{2}{2}, c:\frac{4}{4}, pm:\frac{5}{5}, m:\frac{6}{6}$

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  $i:\frac{1}{1}, c:\frac{2}{2}, pm:\frac{2}{3}, m:\frac{3}{3}$

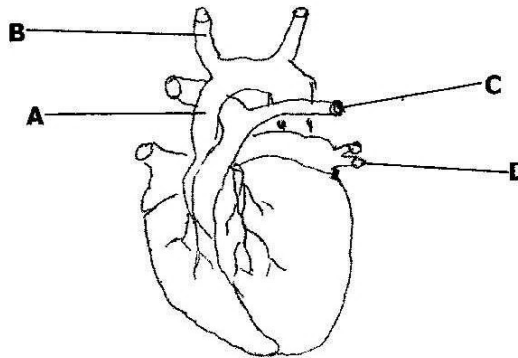
- 11 The diagram below shows part of the digestive tract.



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.
- 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.

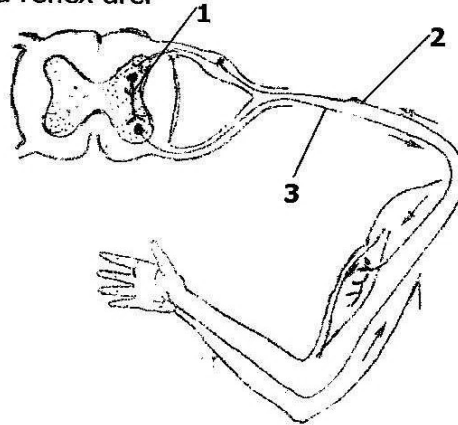
What effect will this have on the release of antidiuretic hormone (ADH) and the reabsorption of water in the body?

	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

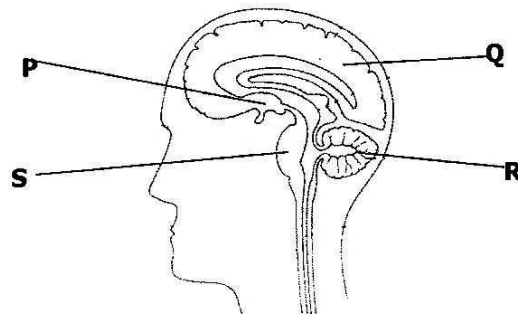
21 The diagram shows a reflex arc.



What are the numbered neurones called?

	<b>1</b>	<b>2</b>	<b>3</b>
<b>A</b>	Relay	Sensory	Motor
<b>B</b>	Relay	Motor	Sensory
<b>C</b>	Motor	Sensory	Relay
<b>D</b>	Motor	Relay	Sensory

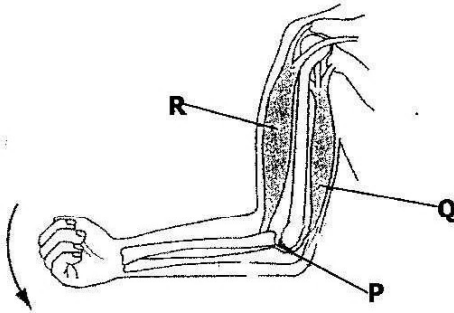
22 The diagram shows a longitudinal section of the human brain.



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

	<b>Heart rate</b>	<b>Reasoning</b>	<b>Temperature</b>
<b>A</b>	P	Q	S
<b>B</b>	Q	R	P
<b>C</b>	R	S	Q
<b>D</b>	S	Q	P

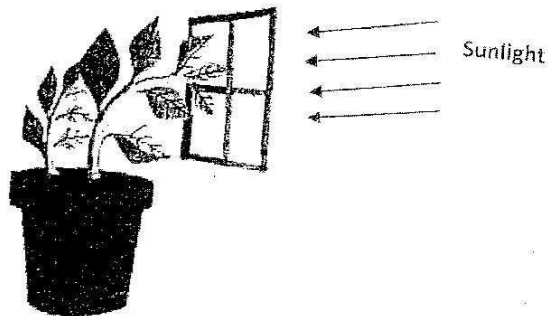
23 The diagram shows bones and muscles of the forelimb.



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

	<b>Joint P</b>	<b>Muscle Q</b>	<b>Muscle 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.

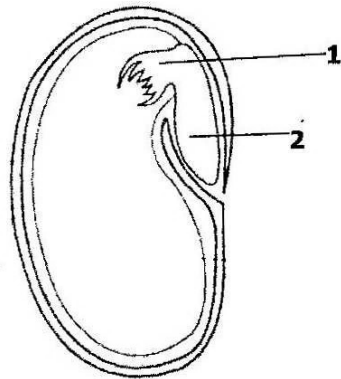


What type of tropic response is illustrated in the diagram?

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



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



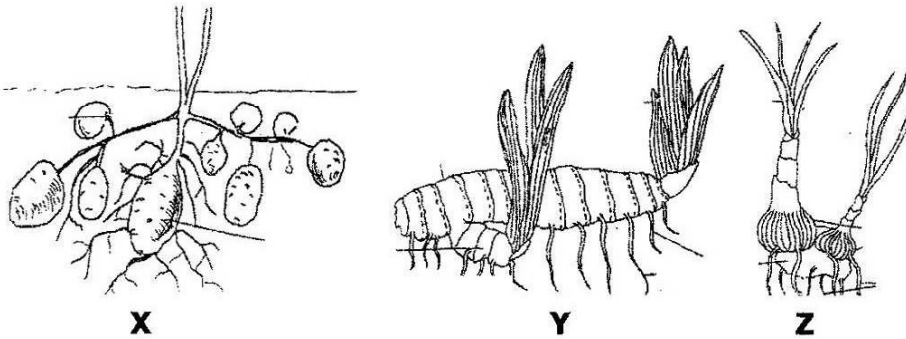
What are the numbered parts?

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

- 26 What type of asexual reproduction occurs in Rhizopus?

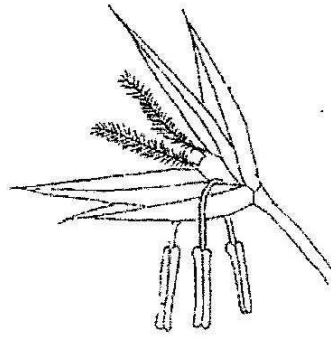
- A Binary fission
- B Budding
- C Fragmentation
- D Spore formation

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



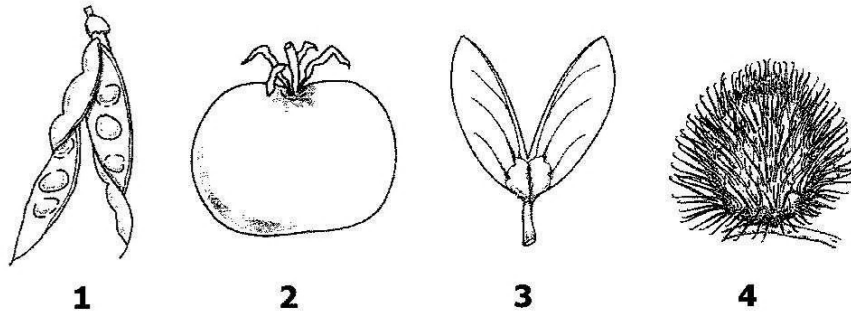
	X	Y	Z
A	Tuber	Bulb	Rhizome
B	Tuber	Rhizome	Bulb
C	Rhizome	Tuber	Bulb
D	Tuber	Bulb	Stolon

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.



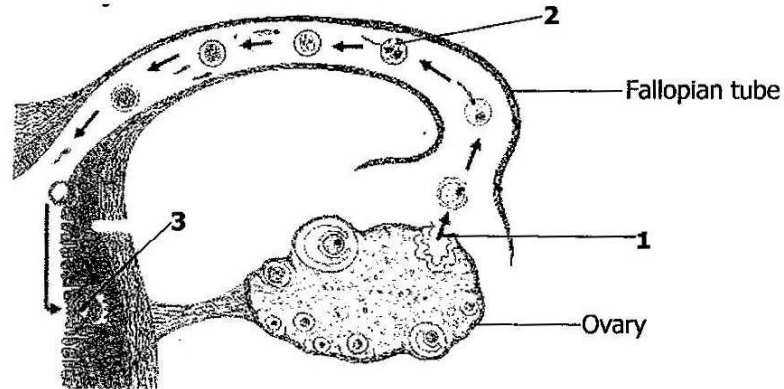
Which **two** fruits are dispersed by animals?

- 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?

	<b>Cowper's gland</b>	<b>Prostate gland</b>	<b>Seminal vesicle</b>
<b>A</b>	Provides lubrication	Activates sperms	Provides nutrients to the sperms
<b>B</b>	Provides lubrication	Provides nutrients to the sperms	Activates sperms
<b>C</b>	Provides nutrients to the sperms	Provides lubrication	Activates sperms
<b>D</b>	Provides nutrients to the sperms	Activates sperms	Produces lubrication

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

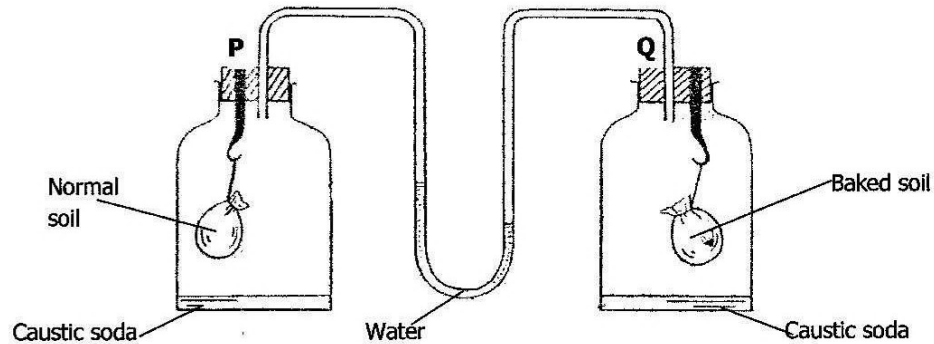


What processes are taking place at points 1, 2 and 3?

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

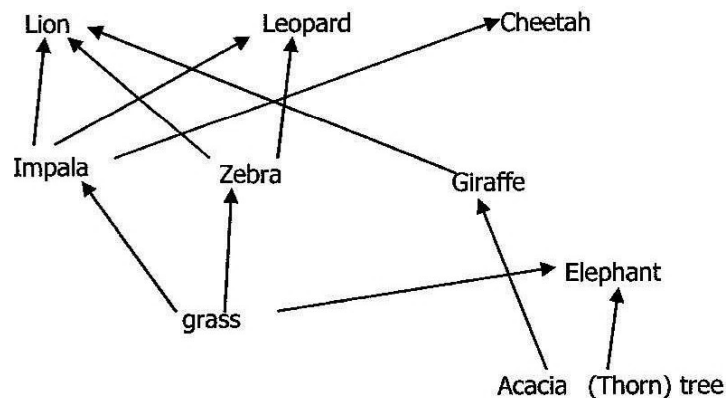
- 32 Vasectomy is one of the methods of preventing pregnancy. Which structure in the male reproductive system is cut during vasectomy?
- A Epididymis
  - B Prostate gland
  - C Sperm duct
  - D Urethra
- 33 Which statement correctly describes events which take place during interphase of mitosis?
- A 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?

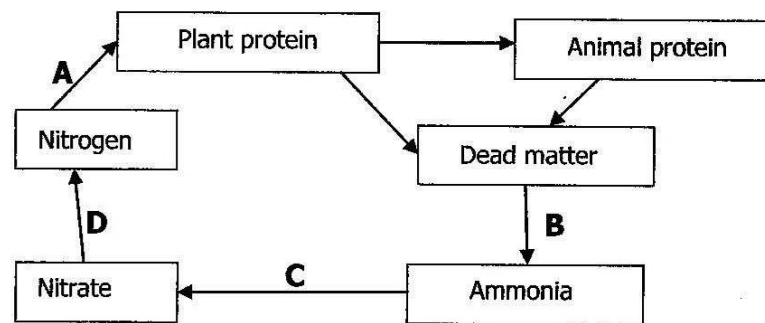
- A** Air  
**B** Humus  
**C** Micro-organisms  
**D** Moisture
- 37 The diagram shows feeding relationships of organisms in an ecosystem.



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
<b>A</b>	Decreases	Decreases	Increases
<b>B</b>	Decreases	Increases	Decreases
<b>C</b>	Increases	Decreases	Decreases
<b>D</b>	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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