

EXAMINATIONS COUNCIL OF ZAMBIA

Examination for General Certificate of Education Ordinary Level

Biology

5090/1

Paper 1 Multiple Choice

2020

Additional Materials:

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

Time: 50 minutes

Marks: 40

Instructions to Candidates

1. Ensure that the **school/centre name and subject paper, subject code, paper number, centre code, your examination number** and the **year** are correctly printed and shaded on the Answer Sheet.
2. There are **forty** questions in this paper. Answer all questions.
3. For each question there are four possible answers: **A, B, C and D**. Choose the **one** you consider correct and shade your choice in **soft pencil** on the separate Answer Sheet.
4. **Read very carefully the instructions on the Answer Sheet.**

Information for Candidates

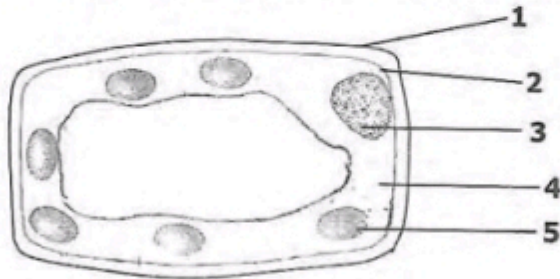
1. Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
2. Any rough working should be done in this Question Paper.
3. Cell phones are not allowed in the examination room.
4. Do not open this Question Paper until you are told to do so.

Answer all the questions.

1 Which of the following is **not** a characteristic of all living organisms?

- A Excretion
- B Photosynthesis
- C Reproduction
- D Respiration

2 The diagram below shows a mesophyll cell of a leaf.

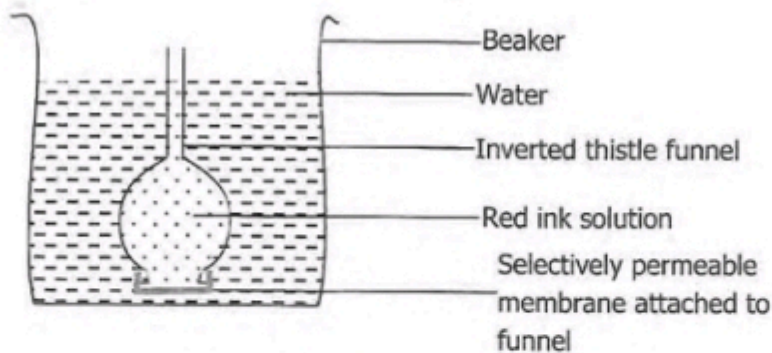


Which labelled structures are **not** found in liver cells of a human being?

- A 1 and 2
- B 1 and 4
- C 1 and 5
- D 3 and 5

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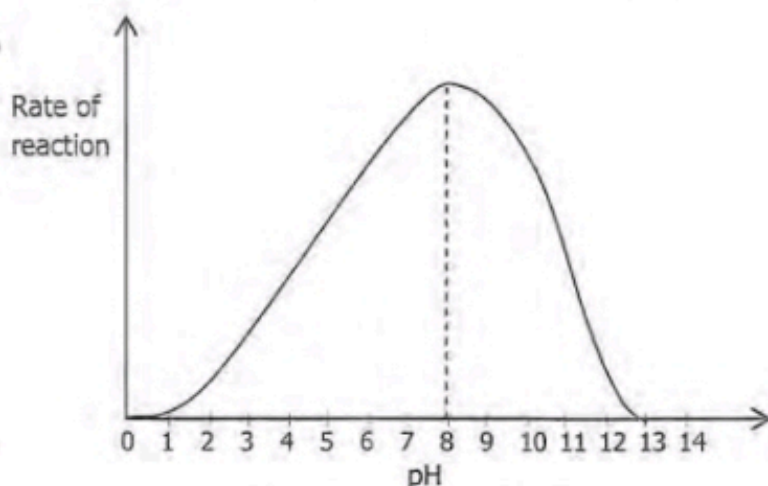
3 The diagram below shows an experiment to demonstrate the movement of molecules.



After one hour, the water in the beaker turned red. What is the most likely reason for this colour change? Molecules of ...

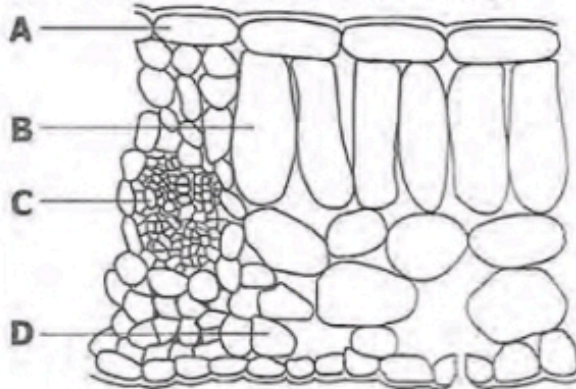
- A red ink move through the membrane by diffusion.
- B red ink move through the membrane by osmosis.
- C water move through the membrane by diffusion.
- D water move through the membrane by osmosis.

- 4 The graph below shows the effects of pH on a particular enzyme controlled reaction.



- At which point is the enzyme **not** active?
- A At pH 1 and pH 13
 B At pH 3 and pH 11
 C At pH 5 and pH 9
 D At pH 7
- 5 Which of the following food nutrients would produce a purple colour when mixed with biuret reagent?
- A Fat
 B Protein
 C Reducing sugar
 D Starch
- 6 Which of the following correctly identifies disorders caused by lack of vitamin C, roughage and protein?
- | | Vitamin C | Roughage | Protein |
|---|-----------|--------------|-------------|
| A | Anaemia | Scurvy | Marasmus |
| B | Anaemia | Constipation | Marasmus |
| C | Scurvy | Anaemia | Kwashiorkor |
| D | Scurvy | Constipation | Kwashiorkor |
- 7 Which of the following plant nutrients keeps cell membranes healthy?
- A Boron
 B Calcium
 C Magnesium
 D Potassium

- 8 The diagram below shows a section through a leaf. Which cell type absorbs the most carbon dioxide during the day?



- 9 The diagram shows a Rhizopus.



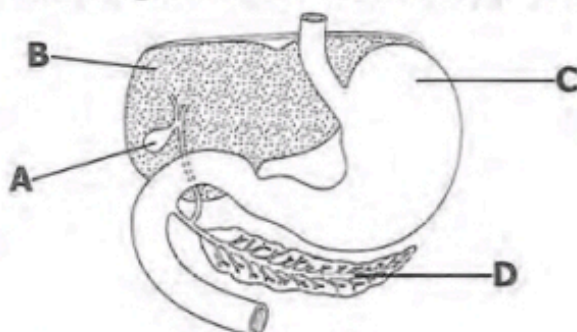
What is the part labelled X?

- A Hyphae
 - B Sporangiphore
 - C Sporangium
 - D Stolon
- 10 The following is the dental formula of a dog.

$$i: \frac{3}{3}, \quad c: \frac{1}{1}, \quad pm: \frac{4}{4}, \quad m: \frac{2}{3}$$

How many molar teeth are there in the upper jaw of this dog?

- A 2
 - B 3
 - C 4
 - D 6
- 11 The diagram below shows part of the human digestive system.



Which of the organs A, B, C, or D carries out deamination of excess amino acids?

- 12 Which of the following correctly identifies parts of the respiratory system where gaseous exchange occurs in humans, fish and insects?

| | In humans | In fish | In insects |
|---|-----------|-----------|------------|
| A | Alveoli | Gills | Tracheoles |
| B | Alveoli | Operculum | Spiracles |
| C | Nostrils | Gills | Tracheoles |
| D | Nostrils | Operculum | Spiracles |

- 13 What is produced during anaerobic respiration in yeast?

| | Lactic acid | Carbon dioxide |
|---|-------------|----------------|
| A | ✓ | ✓ |
| B | ✓ | X |
| C | X | ✓ |
| D | X | X |

KEY

✓ = Produced

X = Not Produced

- 14 Which of the following is a pathogenic disease?

- A Cholera
- B Coronary heart disease
- C Sickle cell anaemia
- D Scurvy

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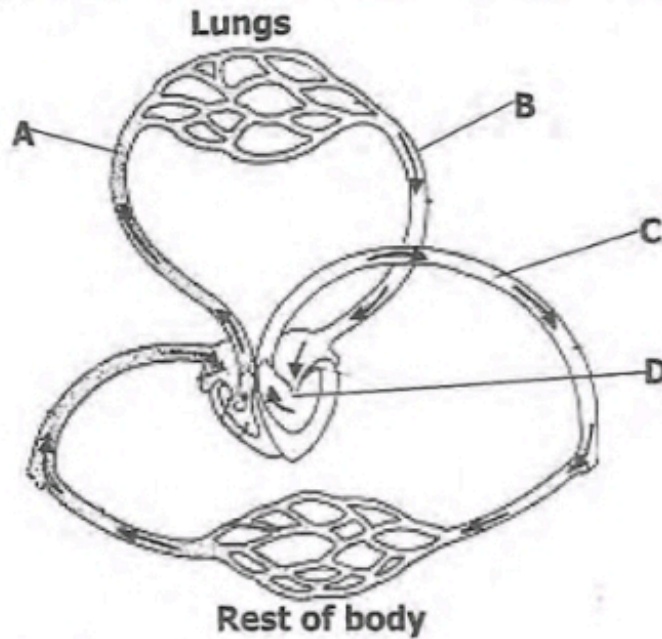
- 15 Which conditions of humidity, light intensity and temperature below make transpiration rate highest?

| | Humidity / % | Light intensity | Temperature / °C |
|---|--------------|-----------------|------------------|
| A | 10 | High | 20 |
| B | 10 | Low | 5 |
| C | 80 | High | 5 |
| D | 80 | Low | 20 |

- 16 Which of the following components is responsible for the clotting of blood?

- A Erythrocytes
- B Lymphocytes
- C Phagocytes
- D Platelets

17 The diagram below shows the human circulatory system.



Which of the parts A, B, C, or D carries oxygenated blood at lower pressure?

18 The table below shows the percentage composition of some chemicals found in blood entering the kidney of a healthy person.

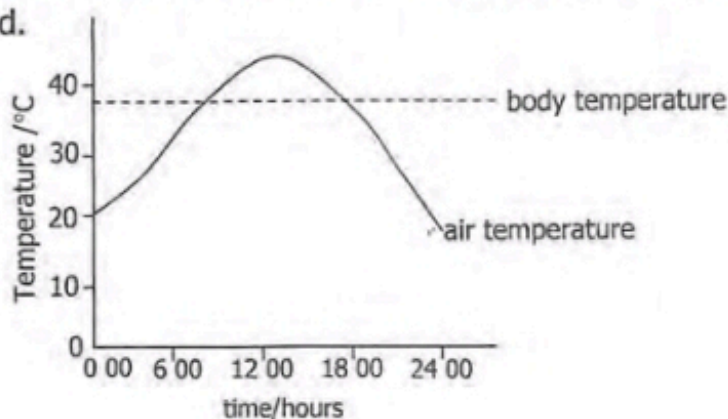
| Chemical | Composition in blood entering kidney /% |
|----------|---|
| Glucose | 0.10 |
| Protein | 8.00 |
| Urea | 0.03 |

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What is the percentage composition of the above chemicals in the urine of the healthy person?

| | Glucose | Protein | Urea |
|---|---------|---------|------|
| A | 0.00 | 0.00 | 2.00 |
| B | 0.00 | 4.00 | 0.00 |
| C | 0.10 | 8.00 | 2.00 |
| D | 1.00 | 4.00 | 0.03 |

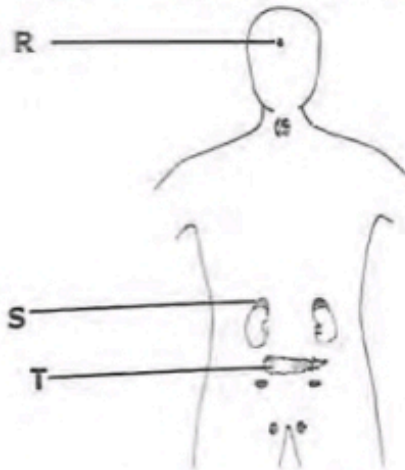
19 The graph shows the air temperature and body temperature during a 24 hour period.



Which mechanism may help to maintain the body temperature between 18 00 hours and 24 00 hours?

- A Decrease in metabolic rate
- B Evaporation of water in the sweat
- C Vasoconstriction of arterioles near the skin surface
- D Vasodilation of arterioles near the skin surface

20 The diagram shows the endocrine glands in a human being.

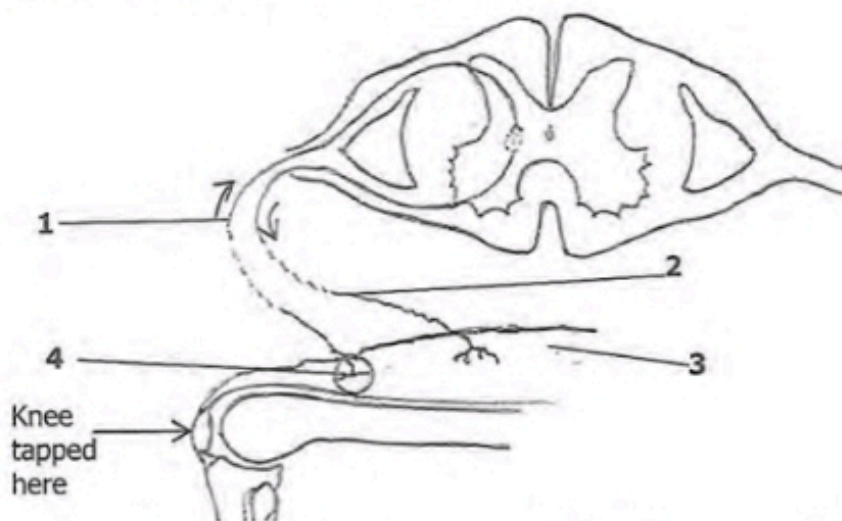


Which hormones are produced by glands R, S and T?

| | R | S | T |
|---|---------|------------|------------|
| A | ADH | Adrenaline | Insulin |
| B | ADH | Insulin | Adrenaline |
| C | Insulin | Adrenaline | ADH |
| D | Insulin | ADH | Adrenaline |

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21 The diagram below shows a reflex arc.



What is the correct order of passage of nerve impulses after the knee is tapped?

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

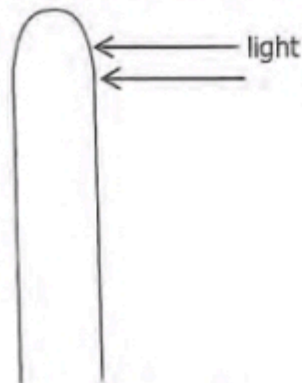
- 22 What role do the ciliary muscles, suspensory ligaments and lens play to focus a nearby object?

| | Ciliary Muscles | Suspensory Ligaments | Lens shape |
|---|-----------------|----------------------|--------------|
| A | Contract | loosen | becomes fat |
| B | Contract | tighten | becomes fat |
| C | Relax | loosen | becomes thin |
| D | Relax | tighten | becomes thin |

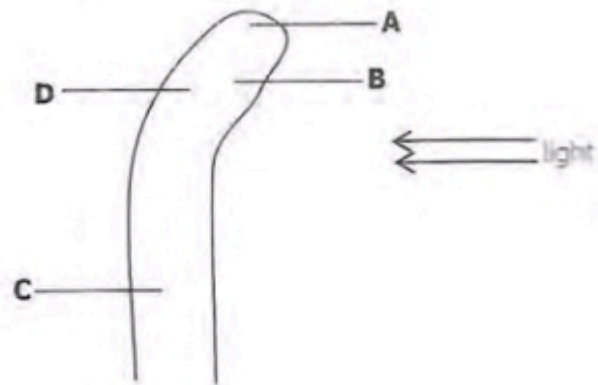
- 23 Which of the following correctly identifies the type and composition of the skeleton of an insect?

| | Type | Composition |
|---|---------------|-------------|
| A | Endo skeleton | Cartilage |
| B | Endo skeleton | Keratin |
| C | Exo skeleton | Chitin |
| D | Exo skeleton | Protein |

- 24 In an experiment to investigate phototropism, a plant shoot is grown with light coming from one side only.



Start of experiment

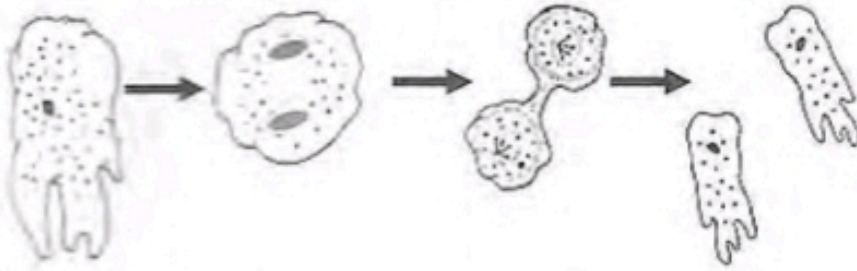


After two days

Which region has the greatest growth after two days?

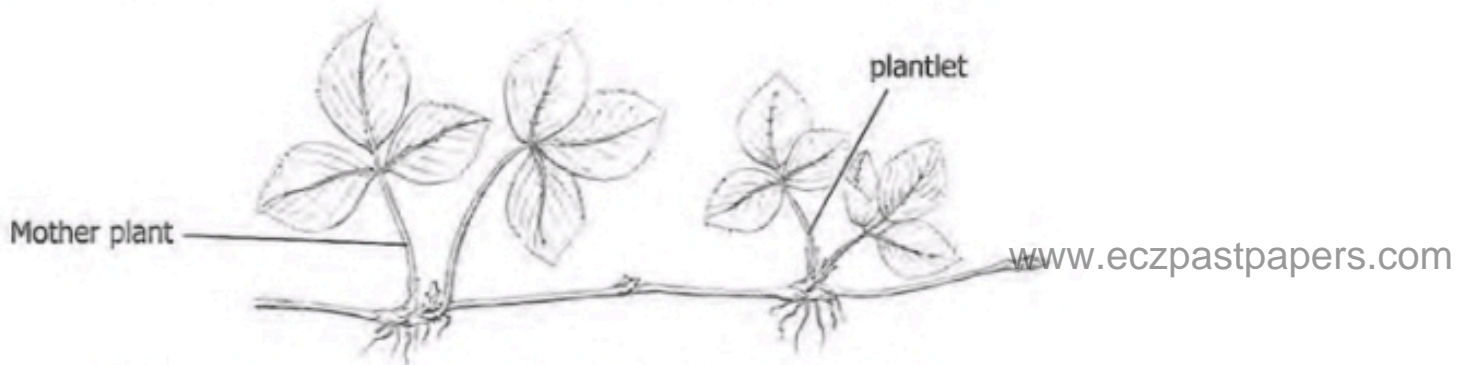
- 25 Which environmental condition is **not** essential for the germination of seeds?
- A Availability of light
 - B Availability of oxygen
 - C Availability of water
 - D Suitable temperature

- 26 The diagram below shows a type of asexual reproduction in bacteria.



What type of asexual reproduction is illustrated above?

- A Binary fission
 B Budding
 C Fragmentation
 D Spore formation
- 27 The diagram shows a plant that is producing small plantlets.



Which statement about the plantlets is correct? They are ...

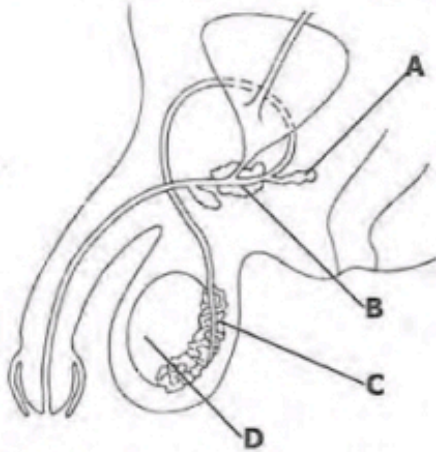
- A genetically different from the parent plant.
 B genetically identical to the parent plant.
 C produced as a result of the fusion of nuclei.
 D produced by fertilising the flowers.
- 28 Flowers show adaptation to wind or insect pollination. Which of the following adaptations are found in a wind pollinated flower?

| | Anthers | Nectary | Petals | Stigma |
|----------|------------------|----------------|-------------------|----------------|
| A | Firmly attached | present | brightly coloured | inside flower |
| B | Firmly attached | present | dull coloured | outside flower |
| C | Loosely attached | absent | brightly coloured | inside flower |
| D | Loosely attached | absent | dull coloured | outside flower |

29 Which method of fruit dispersal occurs in coconut plants?

- A Animal
- B Self
- C Water
- D Wind

30 The diagram below shows the male reproductive system.



Which part produces testosterone?

31 Which structure is involved in the transfer of dissolved nutrients from the mother to the foetus?

- A Kidney
- B Liver
- C Placenta
- D Stomach

32 Which of the following methods of contraception works by inhibiting the production of Follicle Stimulating Hormone (FSH) in the pituitary gland?

- A Condoms
- B Contraceptive pill
- C Intra-uterine Device
- D Vasectomy

33 Which of the following characteristics is an example of discontinuous variation in humans?

- A Height
- B Length of foot
- C Tongue rolling
- D Weight

- 34 A couple produces a child who is an albino. Albinism is a condition in which skin pigment is not made. What is the chance that their next child will be an albino?
- A 0%
 B 25%
 C 50%
 D 100%

- 35 Which of the following four vertebrates in the table is a reptile?

| | Scaly skin | Hair | Four limbs | Tail |
|---|------------|------|------------|------|
| A | ✓ | X | ✓ | ✓ |
| B | ✓ | ✓ | X | ✓ |
| C | X | X | ✓ | X |
| D | X | ✓ | ✓ | ✓ |

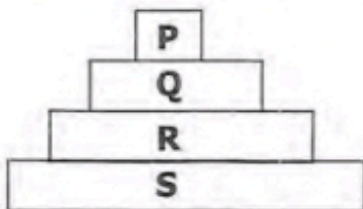
Key
 ✓ = Present
 X = Absent

- 36 Which of the following soil types has the highest nutrient content?

- A Clay
 B Loam
 C Sand
 D Silt

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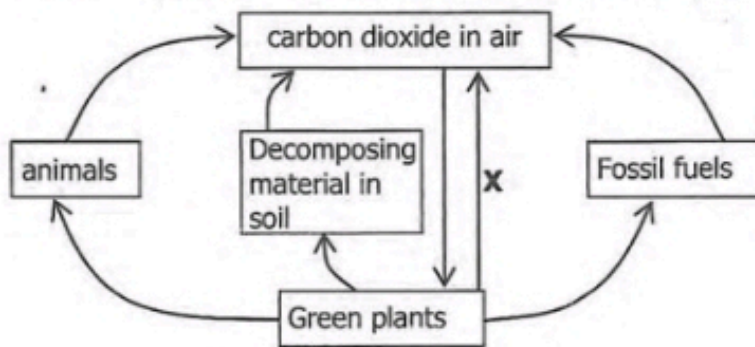
- 37 The diagram shows a pyramid of biomass for all organisms in an ecosystem.



Which organisms are carnivores?

- A P and Q
 B P and R
 C Q and R
 D R and S

38 The diagram below represents the carbon cycle.



What process is represented by letter X?

- A Combustion
- B Feeding
- C Photosynthesis
- D Respiration

39 Over use of fertiliser on huge farms near water bodies cause the chemical in the fertiliser to be wasted into ponds and lakes. This causes eutrophication resulting in the following events:

- 1 algae bloom
- 2 fish dying
- 3 massive growth of bacteria
- 4 oxygen depletion

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In which order do these events occur?

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

40 Which activity will be least likely to lead to the extinction of species?

- A Conservation
- B Deforestation
- C Use of herbicides
- D Use of pesticides