Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY

Paper 1 Multiple Choice (Core)

Additional Materials:
- Multiple Choice Answer Sheet
- Soft clean eraser
- Soft pencil (type B or HB is recommended)

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, glue or correction fluid.
Write your name, Centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.
DO NOT WRITE IN ANY BARCODES.

There are forty questions on 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 the instructions on the Answer Sheet very carefully.

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 booklet.
Electronic calculators may be used.
1 The diagram shows a plant that has been placed near a sunlit window for a few weeks.

Which two characteristics of living organisms have affected the shape of the plant?

A excretion and sensitivity
B growth and reproduction
C reproduction and excretion
D sensitivity and growth

2 What is a characteristic of amphibians but not of reptiles?

A four limbs
B laying eggs in water
C scaly skin
D using lungs for breathing

3 The diagram shows an insect.

Use the key to identify the insect.

1 wings present ......................................... go to 2
   wings absent ......................................... A
2 two pairs of wings ................................. go to 3
   one pair of wings ................................. B
3 wings with circular markings ............... C
   wings without circular markings .......... D
4 The diagram shows a spongy mesophyll cell from a green leaf.

Which labelled structures are not found in animal cells?

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

5 What are the features of the cell walls in a xylem vessel?

<table>
<thead>
<tr>
<th></th>
<th>end wall</th>
<th>side wall</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>absent</td>
<td>thick</td>
</tr>
<tr>
<td>B</td>
<td>absent</td>
<td>thin</td>
</tr>
<tr>
<td>C</td>
<td>present</td>
<td>thick</td>
</tr>
<tr>
<td>D</td>
<td>present</td>
<td>thin</td>
</tr>
</tbody>
</table>

6 The diagram shows a plant cell which has lost water to its surroundings by osmosis.

Which part is the partially permeable membrane?

A B C D
7 Which identifies the chemical elements found in proteins?

<table>
<thead>
<tr>
<th></th>
<th>carbon</th>
<th>hydrogen</th>
<th>oxygen</th>
<th>nitrogen</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>B</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td>C</td>
<td>✓</td>
<td>x</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td>D</td>
<td>x</td>
<td>✓</td>
<td>x</td>
<td>✓</td>
</tr>
</tbody>
</table>

 keyed = ✓ = present  
 x = absent

8 What controls the speed of chemical reactions in all living cells?

A enzymes  
B hormones  
C ions  
D vitamins

9 Where are carbohydrates made in a green leaf?

A cell vacuoles  
B chloroplasts  
C phloem  
D xylem

10 How does carbon dioxide pass through the stomata of a leaf?

A active transport  
B diffusion  
C osmosis  
D transpiration

11 The roots of plants take up nitrates from the soil.

What are the nitrates used to make?

A fat  
B glucose  
C protein  
D starch
12 A child decided to eat only meat, oily fish, cheese and bread, and drink only water.

Which nutrient would be in low levels in this diet?

A  calcium
B  iron
C  vitamin C
D  vitamin D

13 The diagram shows the human alimentary canal.

Which labelled part absorbs the most water?

![Diagram of the human alimentary canal]

14 Which substances are produced by the action of amylase on starch?

A  amino acids
B  fatty acids and glycerol
C  salts
D  simple sugars
15 The diagram shows the stem of a plant. A strip of the outer tissue including the phloem has been removed.

How is transport in the plant affected?

A Amino acids and sugar cannot pass to the roots.
B Dissolved salts cannot pass to the leaves.
C Water cannot pass to the leaves.
D Water cannot pass to the roots.

16 The diagrams show stages in the passage of water through a plant.

Which arrow shows water moving in the form of water vapour?
17 Which graph shows the effect of increasing humidity on the rate of transpiration?

A  
rate of transpiration
humidity

B  
rate of transpiration
humidity

C  
rate of transpiration
humidity

D  
rate of transpiration
humidity
The diagram shows a garden pond with a fountain worked by a pump. The fountain brings oxygen from the air to fish in the pond.

The system can be compared with part of the human circulatory system. The pump is compared with the heart.

What are P and Q compared with?

<table>
<thead>
<tr>
<th></th>
<th>P</th>
<th>Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>aorta</td>
<td>pulmonary artery</td>
</tr>
<tr>
<td>B</td>
<td>pulmonary artery</td>
<td>vena cava</td>
</tr>
<tr>
<td>C</td>
<td>pulmonary vein</td>
<td>vena cava</td>
</tr>
<tr>
<td>D</td>
<td>vena cava</td>
<td>aorta</td>
</tr>
</tbody>
</table>

The diagram shows sections through three types of blood vessel, not drawn to the same scale.

Which section is from a vein and which is from a capillary?

<table>
<thead>
<tr>
<th></th>
<th>vein</th>
<th>capillary</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>V</td>
<td>W</td>
</tr>
<tr>
<td>B</td>
<td>W</td>
<td>V</td>
</tr>
<tr>
<td>C</td>
<td>W</td>
<td>X</td>
</tr>
<tr>
<td>D</td>
<td>X</td>
<td>W</td>
</tr>
</tbody>
</table>
20 The diagram shows human blood cells, as seen under a microscope.

What is the function of cell X?

A to carry glucose
B to carry oxygen
C to defend against disease
D to make the blood clot

21 What is the approximate composition of the air breathed out by a person?

<table>
<thead>
<tr>
<th></th>
<th>oxygen %</th>
<th>carbon dioxide %</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5</td>
<td>73</td>
</tr>
<tr>
<td>B</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>C</td>
<td>21</td>
<td>0.04</td>
</tr>
<tr>
<td>D</td>
<td>78</td>
<td>2</td>
</tr>
</tbody>
</table>

22 Which substances are produced by respiration in humans?

<table>
<thead>
<tr>
<th></th>
<th>carbon dioxide</th>
<th>alcohol (ethanol)</th>
<th>water</th>
<th>lactic acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td>B</td>
<td>✓</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>C</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>D</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
</tr>
</tbody>
</table>
23 The apparatus shown is set up and left for one hour.

A gas is released by the mixture. It caused the indicator solution to go cloudy.

What is the indicator solution?

A alcohol  
B Benedict's solution  
C biuret solution  
D limewater

24 A person is regularly connected to a machine that removes wastes, and excess salts and water, from their blood.

Which organ's function does the machine carry out?

A bladder  
B kidney  
C liver  
D lung
25 The diagram shows the human nervous system.

Which two structures form the central nervous system?
A 1 and 3  B 1 and 4  C 2 and 3  D 2 and 4

26 The flow diagram shows the pathway that causes pupil diameter to decrease in response to bright light.

What does X represent?
A iris  B motor neurone  C relay neurone  D sensory neurone
27 The diagram shows seedlings in two experiments on the tropic response of seedlings to gravity and light.

<table>
<thead>
<tr>
<th>Experiment 1</th>
<th>to show the effect of gravity</th>
</tr>
</thead>
<tbody>
<tr>
<td>start of experiment in the dark</td>
<td>3 days later</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Experiment 2</th>
<th>to show the effect of light</th>
</tr>
</thead>
<tbody>
<tr>
<td>start of experiment</td>
<td>3 days later</td>
</tr>
</tbody>
</table>

Experiment 1 to show the effect of gravity:
- Start of experiment in the dark
- 3 days later

Experiment 2 to show the effect of light:
- Start of experiment
- 3 days later
- Light from one side

How have the seedlings responded?

<table>
<thead>
<tr>
<th></th>
<th>to gravity</th>
<th>to light</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>B</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td>C</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>D</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

Key:
- ✓ = tropic response shown
- x = no tropic response shown

28 When does fertilisation occur in humans?

A when an egg is released
B when implantation occurs
C when sperm and egg nuclei fuse
D when sperm are released
29  The diagram shows part of the reproductive system of a human female.

In which labelled region would implantation of a zygote normally take place?

![Diagram of reproductive system]

30  The diagrams show four methods of birth control.

Which one is placed in the uterus?

![Birth control methods]

31  What is the definition of an allele?

A  a length of DNA that codes for a protein

B  a thread-like structure, carrying genes

C  a version of a gene

D  the genetic make up of an organism

32  Which row describes the cells produced in meiosis, and a function of this type of nuclear division?

<table>
<thead>
<tr>
<th>cells produced</th>
<th>function</th>
</tr>
</thead>
<tbody>
<tr>
<td>A genetically different</td>
<td>asexual reproduction</td>
</tr>
<tr>
<td>B genetically different</td>
<td>sexual reproduction</td>
</tr>
<tr>
<td>C genetically identical</td>
<td>asexual reproduction</td>
</tr>
<tr>
<td>D genetically identical</td>
<td>sexual reproduction</td>
</tr>
</tbody>
</table>
33 A brown mouse mates with a white mouse. There are 8 brown mice and 9 white mice in the offspring.

The same two mice mate again. There are 9 brown mice and 7 white mice in the offspring.

What are the genotypes of the parents most likely to be?

A  heterozygous × heterozygous
B  homozygous dominant × heterozygous
C  homozygous dominant × homozygous recessive
D  homozygous recessive × heterozygous

34 What is the principal source of energy input into a food chain?

A  primary consumer
B  producer
C  secondary consumer
D  the Sun

35 The diagram shows a food web.

Which arrow does not show the direction of energy flow?

plants → D → herbivores → A → carnivores
D → C → decomposers
B → decomposers
36 The diagram shows part of the carbon cycle.

What is the process labelled Z?

A decomposition
B fossilisation
C photosynthesis
D respiration
37 The graph shows the population of mosquito larvae in a pond. On day 3, fish that eat mosquito larvae are released into the pond.

What is the most likely reason for the decline in the population of larvae after day 3?

A  disease  
B  lack of oxygen  
C  old age  
D  predation

38 Why is yeast used in bread-making?

A  Aerobic respiration produces alcohol.  
B  Aerobic respiration produces lactic acid.  
C  Anaerobic respiration produces alcohol.  
D  Anaerobic respiration produces carbon dioxide.

39 Which agricultural activity does not result in pollution of nearby rivers?

A  adding artificial fertilisers  
B  digging plant material into the soil  
C  spraying with herbicides  
D  spraying with insecticides
The diagram shows the results of a survey on the types of animals found along a stretch of river near to a factory.

Which of the following animals lives in the most polluted water?

A  blood worm
B  caddis fly larva
C  leech
D  stonefly nymph
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