BIOLOGY 0610/12
Paper 1 Multiple Choice (Core) October/November 2018
45 minutes

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 All living organisms release energy from nutrient molecules within their cells.

What is the name of this characteristic?
A growth
B nutrition
C respiration
D sensitivity

2 The photographs show two different rats.

![Rattus norvegicus](image1)

![Rattus rattus](image2)

Which statement about the rats is correct?
A The rats are the same genus.
B The rats are the same species.
C The rats can breed together to produce fertile offspring.
D The rats do not share any of the same features.

3 The diagram shows an arthropod.

Which group of arthropods does it belong to?
A arachnids
B crustaceans
C insects
D myriapods
4 Two types of cell, one animal and one plant, were examined using a light microscope.

Which row shows the correct combination of cellular features that would be observed in the cells?

<table>
<thead>
<tr>
<th>cell structure observed</th>
<th>animal cell</th>
<th>plant cell</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>chloroplast</td>
<td>membrane</td>
</tr>
<tr>
<td>B</td>
<td>cytoplasm</td>
<td>nucleus</td>
</tr>
<tr>
<td>C</td>
<td>membrane</td>
<td>cell wall</td>
</tr>
<tr>
<td>D</td>
<td>nucleus</td>
<td>chloroplast</td>
</tr>
</tbody>
</table>

5 The diagram shows part of a leaf in cross-section.

Structures X and Y are both part of the same

A cell.
B organ.
C tissue.
D vessel.

6 A photograph shows a plant cell nucleus measuring 2 mm across.

If the magnification of the cell is \( \times 500 \), what is the actual size of the nucleus?

A 0.00002 mm  B 0.004 mm  C 0.04 mm  D 250 mm
7 How do carbon dioxide and oxygen move into and out of a mesophyll cell?
   A active transport
   B diffusion
   C respiration
   D transpiration

8 The diagram shows apparatus used to investigate osmosis.

   The volumes of solutions A, B, C and D were the same at the start of the investigation.

   After one hour, the solutions had moved up the glass tubes.

   Which solution was the most concentrated at the start of the investigation?
9 The data show the concentrations of sugar and starch in an onion.

<table>
<thead>
<tr>
<th>total sugar including reducing sugar / g per 100g</th>
<th>starch / g per 100g</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.7</td>
<td>0.0</td>
</tr>
</tbody>
</table>

The onion is tested with Benedict’s solution and iodine solution.

Which set of results is correct?

- A blue blue-black
- B blue brown
- C brick red blue-black
- D brick red brown

10 The apparatus shown is used for an experiment on starch digestion.

Which test-tube contains the most sugar after 20 minutes?

- A starch solution and salivary amylase water-bath at 15°C
- B starch solution water-bath at 37°C
- C starch solution and salivary amylase water-bath at 15°C
- D starch solution and salivary amylase water-bath at 37°C
11 An experiment was carried out using the apparatus shown.

The carbon dioxide content of the water in each test-tube was measured at the start and again three hours later.

In which test-tube would there be a decrease in carbon dioxide content?

A B C D

water black polythene to keep out light
water plant
water snail

light

12 The diagram shows a cross-section of a leaf.

Which is the xylem?

A B C D

13 What is the result of a diet lacking iron?

A bleeding gums
B poor wound healing
C reduced number of red blood cells
D weak bones and teeth
14 Which row shows an enzyme with the correct site of production and products?

<table>
<thead>
<tr>
<th></th>
<th>enzyme</th>
<th>enzyme produced by</th>
<th>product(s) of digestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>amylase</td>
<td>salivary glands</td>
<td>amino acids</td>
</tr>
<tr>
<td>B</td>
<td>amylase</td>
<td>stomach</td>
<td>sugar</td>
</tr>
<tr>
<td>C</td>
<td>protease</td>
<td>salivary glands</td>
<td>sugar</td>
</tr>
<tr>
<td>D</td>
<td>protease</td>
<td>stomach</td>
<td>amino acids</td>
</tr>
</tbody>
</table>

15 The diagram shows a plant cell.

What type of plant cell is this?

A guard cell
B mesophyll cell
C root cortex cell
D root hair cell
16 The diagram shows two shoots at the start of an experiment on transpiration.

![Spring balances with shoots](image)

What are the likely readings on the spring balances after three days?

<table>
<thead>
<tr>
<th></th>
<th>Shoot X/g</th>
<th>Shoot Y/g</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td><strong>D</strong></td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

17 The diagram shows a circulatory system.

![Circulatory system](image)

Which vessels carry oxygenated blood?

- A 1 and 2
- B 1 and 4
- C 2 and 3
- D 2 and 4
18 Some organisms cause transmissible diseases.

What is defined as a disease-causing organism?

A bacterium
B pathogen
C phagocyte
D virus

19 The graph shows changes in the volume of air in the lungs of a person at rest, over a period of 30 seconds.

Which graph shows changes in the volume of air in the lungs of the same person immediately after they have done five minutes of vigorous exercise?
20 As we breathe out, ......1...... is ......2...... through the lungs.

Which words correctly complete gaps 1 and 2?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>carbon dioxide</td>
<td>excreted</td>
</tr>
<tr>
<td>B</td>
<td>carbon dioxide</td>
<td>respired</td>
</tr>
<tr>
<td>C</td>
<td>oxygen</td>
<td>excreted</td>
</tr>
<tr>
<td>D</td>
<td>oxygen</td>
<td>respired</td>
</tr>
</tbody>
</table>

21 A person carries out vigorous exercise without drinking any water.

What would happen to the concentration and volume of the person’s urine immediately after exercise?

<table>
<thead>
<tr>
<th></th>
<th>urine concentration</th>
<th>urine volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>decrease</td>
<td>decrease</td>
</tr>
<tr>
<td>B</td>
<td>decrease</td>
<td>increase</td>
</tr>
<tr>
<td>C</td>
<td>increase</td>
<td>decrease</td>
</tr>
<tr>
<td>D</td>
<td>increase</td>
<td>increase</td>
</tr>
</tbody>
</table>

22 The diagram shows a reflex arc.

Which label points to the sensory neurone?
23. What does the central nervous system consist of?
   A. brain, spinal cord and peripheral nerves
   B. brain and spinal cord only
   C. brain only
   D. spinal cord and peripheral nerves only

24. Where is alcohol broken down in the body?
   A. bladder
   B. kidneys
   C. liver
   D. stomach

25. The diagram shows parts of a flower.
   Which structure represents the site of fertilisation?
26  The diagram shows the female reproductive system.

Where does implantation normally occur?

A  B  C  D

27  Which precautions could help to prevent the spread of AIDS?

1  avoiding the mixing of blood
2  using a femidom
3  using the contraceptive pill
4  using a condom

A  1 and 3    B  1, 2 and 4    C  2, 3 and 4    D  2 and 4 only
28 The diagram shows a timeline of a woman’s menstrual cycle, which lasts for 28 days.

On which days of the menstrual cycle is a woman most likely to become pregnant?

A days 1–4
B days 7–10
C days 13–16
D days 20–23

29 What is the transmission of genetic information from generation to generation known as?

A cell division
B inheritance
C meiosis
D mitosis
30 The diagram shows the chromosomes in one human cell.

![](chromosomes.png)

What can be concluded from the chromosomes in this cell?

A The cell is from a man.
B The cell is from a woman.
C There are only 23 chromosomes per cell.
D There are only 46 pairs of chromosomes per cell.

31 The allele for detached earlobes is dominant to the allele for attached earlobes.

Two parents are heterozygous for detached earlobes.

What is the probability of their first child having attached earlobes?

A 0%  
B 25%  
C 50%  
D 75%

32 Which is an example of discontinuous variation?

A height
B skin colour
C tongue rolling
D weight
33 Farmers have bred Holstein-Friesian cattle to produce more milk than older breeds of cattle.

Which process was used to produce these cattle?

A adaptation
B genetic engineering
C natural selection
D selective breeding

34 The diagram shows a food web.

Which row shows a food chain in this food web?

<table>
<thead>
<tr>
<th></th>
<th>producer</th>
<th>primary consumer</th>
<th>secondary consumer</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>hedgehog</td>
<td>caterpillar</td>
<td>robin</td>
</tr>
<tr>
<td>B</td>
<td>cabbage plant</td>
<td>greenfly</td>
<td>beetle</td>
</tr>
<tr>
<td>C</td>
<td>cabbage plant</td>
<td>beetle</td>
<td>robin</td>
</tr>
<tr>
<td>D</td>
<td>rose plant</td>
<td>hedgehog</td>
<td>greenfly</td>
</tr>
</tbody>
</table>
35 The diagram shows part of the carbon cycle.

Which arrow represents photosynthesis?

![Carbon cycle diagram]

A B C D

36 The population of rabbits in a woodland halves over a ten year period. Rabbits are herbivores.

What could have caused this change?

A an increased food supply
B an increased light intensity
C an increased number of predators
D an increased water supply

37 The production of ethanol for biofuels involves two stages.

Firstly, starch is converted to glucose by ......1...... . Secondly, glucose is converted to ethanol by ......2...... during ......3...... .

Which row correctly completes gaps 1, 2 and 3?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>enzymes</td>
<td>bacteria</td>
<td>aerobic respiration</td>
</tr>
<tr>
<td>B</td>
<td>enzymes</td>
<td>yeast</td>
<td>anaerobic respiration</td>
</tr>
<tr>
<td>C</td>
<td>pectinase</td>
<td>bacteria</td>
<td>aerobic respiration</td>
</tr>
<tr>
<td>D</td>
<td>pectinase</td>
<td>yeast</td>
<td>anaerobic respiration</td>
</tr>
</tbody>
</table>
Scientists have produced yellow rice called Golden Rice. Golden Rice has been produced by the insertion of genes into rice plants.

What is involved in the production of Golden Rice?

A genetic engineering
B mutation
C natural selection
D selective breeding

What is a negative impact on the environment caused by deforestation?

A decrease in land for livestock production
B decreased levels of carbon dioxide in the air
C increase in flooding
D increased levels of soil

Which is a greenhouse gas?

A herbicides
B insecticides
C methane
D oxygen