EXAMINATIONS COUNCIL OF ZAMBIA

Joint Examination for the School Certificate and General Certificate of Education Ordinary Level

BIOLOGY
PAPER 1 Multiple Choice

Wednesday 14 NOVEMBER 2001 50 minutes

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 booklet 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 booklet.
1 The diagram shows an animal cell.

Which structure A, B, C, or D, controls the substances that enter or leave the cell?

2 What is the main characteristic feature of the red blood cell that helps it perform its function efficiently?
   
   A The round shape  
   B The lack of a nucleus  
   C The presence of haemoglobin  
   D The biconcave shape

3 Two different concentrated sugar solutions are put in a beaker and are separated by a selectively permeable membrane as shown below.

Which of the following beakers shows the correct end result of the experiment?
4 The table below shows a set of enzymes, their substrate and the pH on which they are reacting.

<table>
<thead>
<tr>
<th>Enzyme</th>
<th>Substrate</th>
<th>pH</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Amylase</td>
<td>7</td>
</tr>
<tr>
<td>B</td>
<td>Pepsin</td>
<td>10</td>
</tr>
<tr>
<td>C</td>
<td>Lipase</td>
<td>8</td>
</tr>
<tr>
<td>D</td>
<td>Maltase</td>
<td>7</td>
</tr>
</tbody>
</table>

Which of these enzymes would fully break down its substrate?

5 The temperature of the environment of an enzyme is raised from 20°C to 30°C. Which of the statements below best describes the enzyme activity after the temperature rise?

A The enzyme would be denatured
B The enzyme reaction rate would be higher
C The enzyme activity would be at optimum
D The enzyme would now catalyse the reaction

6 Four food substances are tested for glucose using Benedict's reagent and for protein using the Biuret reagent. The tests gave the following results:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Benedict's reagent</th>
<th>Biuret reagent</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Orange</td>
<td>Purple</td>
</tr>
<tr>
<td>B</td>
<td>Orange</td>
<td>Blue</td>
</tr>
<tr>
<td>C</td>
<td>Yellow</td>
<td>Blue</td>
</tr>
<tr>
<td>D</td>
<td>Blue</td>
<td>Purple</td>
</tr>
</tbody>
</table>

Which substance contains both glucose and protein?

7 Which secretion contains a fat digesting enzyme?

A Bile
B Saliva
C Gastric juice
D Pancreatic juice
8 Which of the following is correctly matched for the enzyme and the organ from which it is secreted?

<table>
<thead>
<tr>
<th>Organ</th>
<th>Enzyme</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Pancreas</td>
<td>Pepsin</td>
</tr>
<tr>
<td>B Salivary gland</td>
<td>Amylase</td>
</tr>
<tr>
<td>C Stomach</td>
<td>Trypsin</td>
</tr>
<tr>
<td>D Duodenum</td>
<td>Lipase</td>
</tr>
</tbody>
</table>

9 The diagram shows a transverse section of a stem.

Which of these regions will contain a high concentration of sugar solution?

10 The diagram below shows an artery.

Which of the items given below could have a direct contribution to the fatty deposits in the artery?

A A protein diet
B Regular exercise
C Insufficient bile
D Regular smoking
11 A human being at complete rest uses only 4 kilojoules of energy per minute. A gram of glucose has an energy value of 16 kilojoules of energy. How long will 4g of glucose last as a source of energy during complete rest?
A  4 minutes
B  12 minutes
C  16 minutes
D  64 minutes

12 Which of the following is the correct equation for anaerobic respiration in man?
A  Glucose → carbon dioxide + water + energy
B  Glucose → lactic acid + energy
C  Glucose → ethanol + carbon dioxide + energy
D  Glucose → ethanol + energy

13 The diagram shows part of the excretory system.

Name structure X.
A  Uterus
B  Urethra
C  Ureter
D  Nephron
14 The lack of magnesium in plants ...  
A reduces chlorophyll formation  
B causes leaves to turn green  
C causes roots to be small  
D reduces water uptake by roots

15 Which of the following statements best describes transpiration?  
A Loss of oxygen to the surroundings  
B Loss of water vapour through stomata  
C Loss of nutrients to the surroundings  
D Inability to photosynthesise

16 Which of the following is the medium through which dissolved foods reach the cells of the tissue?  
A Lymph  
B Blood  
C Water  
D Tissue fluid

17 Bones at a joint are held together by ...  
A cartilage  
B tendon  
C ligament  
D muscles

18 Which of the following is not normally present in urine?  
A Glucose  
B Water  
C Urea  
D Sodium chloride

19 Which of the following does not help retain heat in the human body?  
A Increased muscular activity  
B Vaso-constriction  
C Reduced or no sweating  
D Wearing warm, thick clothes
20 Which of these is not a result of antagonistic muscle action?
A Opening of pupil
B Flexing of arm
C Thickening of lens
D Movement of food in oesophagus

21 The diagram shows a section through the eye.

Which of the structures has light sensitive cells?

22 What happens during accommodation in the eye?
A The pupil opens
B The pupil constricts
C The focal length of lens changes
D The iris muscles contract

23 The diagram shows a section through the brain.

Which part controls muscular co-ordination?
24 What hormone is secreted by the gland X?

A Insulin
B Glucagon
C Adrenaline
D Thyroxine

25 Which of the drugs below if taken stimulates vasodilation in the skin?

A Nicotine
B Asprin
C Heroin
D Alcohol

26 A person who is about to speak to an audience is likely to experience a “flutter” or a “hollow stomach.” This feeling is due to the secretion of the hormone . . .

A insulin
B adrenaline
C thyroxine
D oestrogen
The diagram below shows a section through the apparatus used in an experiment to investigate the behaviour of some small invertebrates.

30 invertebrates were placed in the middle and subjected to light for 20 minutes. All the invertebrates were observed to have migrated to the dark corners.

This response of the invertebrates is an example of a...
A  positive phototropism
B  negative phototropism
C  positive phototaxis
D  negative phototaxis

In the given food chain, what tropic level is occupied by the woodpecker?

Sun → Plants → Caterpillar → Woodpecker → Kestrels

A  2nd tropic level
B  3rd tropic level
C  4th tropic level
D  5th tropic level

Which of the following is a direct effect of introducing raw sewage into a river?
A  Oxygen levels would reduce.
B  Number of fish would increase.
C  Plant growth would reduce.
D  Bacterial growth would increase.
30 Which of the following describes the way in which the malaria pathogen is transmitted?
A By bathing in water containing mosquito larvae
B By a bite from a female culex mosquito
C By a bite from a female anopheles mosquito
D By a bite from a plasmodium

31 Which of the following is a likely effect of sulphur dioxide release into the environment?
A Reduction of plant growth
B Reduction of soil acidity
C Destruction of ozone layer
D Reduction of carbon dioxide

32 The diagram below shows the female part of a flower. Which structure will develop into the fruit after successful fertilization?

[Diagram of a flower with labeled parts A, B, C, D.]

33 The diagram shows the amount of DDT in each animal in a food chain.

- Plankton → Shrimp → Minnows → Ducks
- 0.04 ppm → 0.16 ppm → 0.50 ppm → 26.40 ppm
The graph, too shows the relationship of Minnows – Ducks over a period of years.

If DDT was continuously released to the environment, which of the following could have been the possible reason for the sudden rise in number of Ducks at point A?

A Ducks resistant to DDT could have evolved
B DDT lost its potent power as a result of continual use
C As the number of minnows increased there was more food for the ducks
D The environment became very favourable for Ducks

34 Which of the following pairs of information correctly compares the male and female gametes?

<table>
<thead>
<tr>
<th>Male gamete</th>
<th>Female gamete</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Larger</td>
<td>Smaller</td>
</tr>
<tr>
<td>B Has own food reserve</td>
<td>Does not have own food reserve</td>
</tr>
<tr>
<td>C Mobile</td>
<td>Immobile</td>
</tr>
<tr>
<td>D Less numbers produced</td>
<td>Large numbers produced</td>
</tr>
</tbody>
</table>

35 The diagram shows the reproductive system and associated structures of a human male.
What is structure X?
A  Uterus
B  Ureter
C  Sperm duct
D  Urethra

36  An adopted child of blood type O has located the biological father and discovered that he has blood type B. Which blood type could not be a possible blood type of the mother?
A  A
B  B
C  AB
D  O

37  Units of inheritance affecting the same character or trait and located on the same position in homologous chromosome are called . . .
A  alleles
B  genes
C  chromatids
D  loci

38  A couple has three successive daughters. What is the chance that the fourth child will also be a girl?
A  25%
B  50%
C  75%
D  100%

39  Which of the following is an example of discontinuous variation?
A  Height range in a class from 120cm to 155cm
B  A family of six boys and four girls
C  Body weights ranging from 50kg to 80kg
D  Skin colour in a community

40  The number of chromosomes in a gorilla cheek cell is 48. How many chromosomes will its ovum have?
A  96
B  48
C  23
D  24
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