INSTRUCTIONS TO CANDIDATES:

- Write your name and index number in the spaces provided.
- Answer all the questions in Section A in the spaces provided.
- In section B answer questions 6 (compulsory) and either question 7 or 8 in the spaces provided.

For Examiner’s Use Only:

<table>
<thead>
<tr>
<th>SECTION</th>
<th>QUESTIONS</th>
<th>MAXIMUM SCORE</th>
<th>CANDIDATES SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>8</td>
<td></td>
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<tr>
<td></td>
<td>2</td>
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<td>5</td>
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<tr>
<td>B</td>
<td>6</td>
<td>20</td>
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<td></td>
<td>7</td>
<td>20</td>
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<tr>
<td></td>
<td>8</td>
<td>20</td>
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</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>80</td>
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</tr>
</tbody>
</table>

This paper consists of 8 printed pages. Candidates should check to ascertain that all papers are printed as indicated and that no questions are missing.

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1. Study the phenotypic chart below showing the inheritance of the gene responsible for haemophilia in a family.

![Phenotypic chart showing inheritance of haemophilia](image)

(a) Write the genotype of individuals A and F. (2mks)

A: .................................................................

F: .................................................................

(b) A member of this family labeled C marries a carrier family. What will be the phenotypic ration of the offspring? Show your workings. (4mks)

(c) Other than the condition stated above, state any other two common genetic disorders that remit from gene mutation. (2mks)

2. (a) Distinguish between Homologous structures and analogous structures. Give an example in each case. (4mks)

Homologous structure: .................................................................

Example: ..............................................................................

Analogous structures: .................................................................

Example: ..............................................................................
(b) Explain why same parasites develop resistance to certain drugs after a long time of exposure. (2mks)

(c) (i) What is non-disjunction? (1mk)

(ii) Give one example of a genetic disorder associated with non-disjunction. (1mk)

3. Diagrams A, B and C below show cross-sections of three different types of blood vessels. They are not drawn to scale.

(a) Identify blood vessels A, B and C (3mks)

A .................................................................

B .................................................................

C .................................................................

(b) (i) Name the layer labeled X on vessel A (1mk)

(ii) State two ways in which vessels A is adapted to its functions (2mks)

(c) (i) What is an immune response? (1mk)

(ii) Name one disease that is effectively controlled through vaccination (1mk)
4. (a) What is meant by the term fertilization? 

(b) (i) Name the type of cell division that produces gametes 

(ii) Where does the type of cell division mentioned above occur in mammals? 

(c) What happens to the wall of the uterus; 

(i) before the release of an egg? 

(ii) if no fertilization occurs? 

(b) How is the placenta adapted to its functions? 

5. The diagram below represents setups arranged by a group of students investigating certain characteristics of enzymes.

After thirty minutes the students tested the contents of the test tubes for sucrose.

(a) In which of the three setups was the test for sucrose negative? 

(b) For each of the test tubes where the test for sucrose was positive, explain why? 

(c) State the two characteristics of enzymes the students were investigating.
(d) Name two reagents the students used while testing for sucrose. 

…………………………………………………………………………………………………………………
…………………………………………………………………………………………………………………

(e) Give the general name for all enzymes which digest proteins. 

(1mk)

SECTION B (40 MARKS)

Answer question 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8

6. An experiment was carried out to investigate the rate of growth of pollen tube against time. The results are shown in the table below:

<table>
<thead>
<tr>
<th>Time in minutes</th>
<th>Growth of pollen tube in millimeters</th>
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<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>30</td>
<td>4.0</td>
</tr>
<tr>
<td>60</td>
<td>9.8</td>
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<tr>
<td>90</td>
<td>15.2</td>
</tr>
<tr>
<td>120</td>
<td>20.0</td>
</tr>
<tr>
<td>150</td>
<td>21.6</td>
</tr>
<tr>
<td>180</td>
<td>22.4</td>
</tr>
</tbody>
</table>

(a) (i) On the grid provided draw a graph of the pollen tube growth against time. 

(7mks)
(b) (i) At what intervals was the growth of the pollen tube measured? (1mk)

(ii) What was the length of pollen tube at 130 minutes; (1mk)

(iii) At what time was the length of the pollen tube 18mm? (1mk)

(iv) With reasons, describe the growth pattern of the pollen tube between:

0 to 120 minutes. (2mks)
Reason

120 to 180 minutes. (2mks)
Reason

(v) State the importance of the growth of pollen tube to the plant (1mk)

(c) State the changes that take place in a flower after fertilization (5mks)

7. Explain how the various activities of man have caused air pollution. (20mks)

8. (a) What is meant by digestion? (2mks)

(b) Describe how mammalian small intestine is adapted to its function. (18mks)