INSTRUCTIONS TO CANDIDATES:

- Write your name and index number in the spaces provided.
- Sign and write date of examination in the spaces provided above
- Answer all the questions in section A and B
- You are required to spend the first 15 minutes of the 1 ½ hours allowed for this paper reading the whole paper carefully.

For Examiner’s Use Only:

<table>
<thead>
<tr>
<th>QUESTIONS</th>
<th>MAXIMUM SCORE</th>
<th>CANDIDATES SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>12</td>
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<tr>
<td>TOTAL</td>
<td>40</td>
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</tbody>
</table>

This paper consists of 4 printed pages. Candidates should check to ascertain that all papers are printed as indicated and that no questions are missing.
1. You are provided with photographs of specimens labelled M1 M2 M3 M4 M5 and M6. Examine these specimens and study the identification key below.

   a. Fruit formed from a single flower with one or more carpels. Go to 2
   b. Fruit formed from several flowers, ovaries and other parts of the flower e.g receptacle.

   Multiple fruit

2 a. Fruit succulent or fleshy. Go to 3
   b. Fruit hard or stony and enclosed seed. Drupe

3 a. Fruit one-seeded; endocarp thin while mesocarp is thick and fleshy; endocarp hard or stony and enclosed seed. Drupe
   b. Fruit with several seeds. Epicarp is thin while mesocarp and endocarp are both thick and fleshy. Berry

4 a. Pericarp of fruit becomes dry and splits open to release the seeds at maturity. Go to 6
   b. Pericarp of fruit becomes dry but does not split open to release the seeds at maturity. Cypsela

5 a. Fruit of grass family; has thin pericarp fused with seed coat. Caryopsis
   b. One-seeded fruit with remains of calyx above the ovary forming hooks for animal dispersal. Cypsela

6 a. Fruit splits along two lines at maturity. Legume
   b. Fruit splits into several one-seeded units. Schizocarp

a) Complete part 2. b) of the dichotomous key above.
   (1 mk)

b) Use the identification key above to identify the plant specimens provided. In each case show the sequence of steps (e.g. 1a, 2b, 3b, etc) in the key which you followed to arrive at the identity of each specimens.
   (4mks)

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Steps</th>
<th>Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>M2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
c) State the type of placentation shown by specimens M₂ and M₆. (2 mks)
   M₂…………………………………………………………………………………………………………………
   M₆…………………………………………………………………………………………………………………

d) i. State the agent of dispersal of specimen M₅. (1mk)
    ……………………………………………………………………………………………………………………
ii. Give a reason for your answer in d) i above. (1mk)
    ……………………………………………………………………………………………………………………

e) You are provided with 001% DCPIP solution, specimens X and Z, scalpel blade and sieve. Cut small
   pieces of X enough to produce 10 drops of undiluted juice. Smash the pieces in a clean sieve and collect
   the filtrate in clean beaker. Take the cut section of Z and squeeze the juice through a clean sieve into
   another beaker. Measure 2ml of 0.01% DCPIP in two clean beakers. Using clean droppers, find out the
   number of drops of each juice required to decolorize the DCPIP. (2 mks)
   i) Record your results in the table below:
      | Juice Extract | No drops needed to change colour of DCPIP |
      |---------------|------------------------------------------|
      | X             | ............................................. |
      | Z             | ............................................. |
   ii) Account for your results stated in e) i above. (2 mks)
        ……………………………………………………………………………………………………………………
        ……………………………………………………………………………………………………………………
  I) i. Suggest the expected results if the juice from specimen X was boiled for thirty minutes,
       cooled and added drop by drop to DCPIP solution (1 mk)
       ……………………………………………………………………………………………………………………
       ……………………………………………………………………………………………………………………
ii. Explain the expected results in I’ (1) above (1 mk)
       ……………………………………………………………………………………………………………………
       ……………………………………………………………………………………………………………………

2. You are provided with cotton wool, Petri dish, light blue suspension labelled K and a dropper. Put about
   half of the cotton wool provided in a Petri dish. Add a few drops of the suspension and press with thy
   cotton wool to remove excess stain. This will be your improvised stamp pad (2 mks)
   a) Wash and dry your hands thoroughly and press the left thumb on the stained cotton wool.
      i. Make an impression of your finger print inside the square below: (2 mks)
ii. Use the chart provided to classify your fingerprint. (1 mk)

![Chart of Main Finger Print Types]

b) i) Finger print is one of the complex variations in human beings. Identify the type of variation exhibited by fingerprints. (1 mk)

………………………………………………………………………………………………

ii) Give a reason for your answer in b. i) above. (1 mk)

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

c) Below are specimen thumb prints made by nine students. Study them and answer the questions that follow:

![Specimen Thumb Prints]

i. Tabulate the frequencies of each class of finger print among the above group of students. (2 mks)

<table>
<thead>
<tr>
<th>Type of finger print</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch</td>
<td></td>
</tr>
<tr>
<td>Loop</td>
<td></td>
</tr>
<tr>
<td>Whorl</td>
<td></td>
</tr>
<tr>
<td>Double whorl</td>
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</tbody>
</table>
ii. Using the frequencies obtained in the above table, plot a graph showing the number of students having each type of fingerprint on the piece graph paper provided below.

3. You are provided with two bones specimens L and M

(a) Identify each bone and the part of the body where it is found. (4 marks)

<table>
<thead>
<tr>
<th>Bone</th>
<th>Name</th>
<th>Part of the body</th>
</tr>
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<tbody>
<tr>
<td>L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
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</tbody>
</table>

(b) (i) Make a well labelled diagram of later view of specimen L (3mks)
(ii) State the magnification of your drawing. (1 mk)

(c) Identify two structural differences between bones L and M (2 mks)

<table>
<thead>
<tr>
<th>L</th>
<th>M</th>
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(d) State three ways in which bone M is adapted to its functions. (3 mks)