Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 10

NOVEMBER 2017

LIFE SCIENCES P1

MARKS: 150

TIME: 2½ hours

XLFSE1

This question paper consists of 11 pages.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1.   Answer ALL the questions.

2.   Write ALL the answers in your ANSWER BOOK.

3.   Start the answer to EACH question at the top of a NEW page.

4.   Number the answers correctly according to the numbering system used in this question paper.

5.   Present your answers according to the instructions of each question.

6.   Do ALL drawings in pencil and label them in blue or black ink.

7.   Draw diagrams, tables or flow charts only when asked to do so.

8.   The diagrams in this question paper are NOT necessarily drawn to scale.

9.   Do NOT use graph paper.

10.   You may use a non-programmable calculator, protractor and a compass where necessary.

11.   Write neatly and legibly.

12.   Round off all calculations to two decimals after the comma.

SECTION A

QUESTION 1

1.1   Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A–D) next to the question number (1.1.1–1.1.8) in the ANSWER BOOK, for example 1.1.10 D.

    1.1.1   The axial skeleton is made up of the following regions:

        A   Skull, vertebral column and hip bones
        B   Skull, vertebral column, ribs and sternum
        C   Skull, pectoral girdle, ribs and sternum
        D   Skull, pelvic girdle, ribs and sternum

    1.1.2   The building blocks of proteins is …

        A   disaccharides.
        B   monosaccharides.
        C   amino acids.
        D   glycerol.

    1.1.3   The mitochondria is the site of …

        A   photosynthesis.
        B   cellular respiration.
        C   cellular division.
        D   cytokinesis.

    1.1.4   The single membrane surrounding a vacuole:

        A   Lysosome
        B   Plastid
        C   Tonoplast
        D   Dictyosome

    1.1.5   Protein substance produced by the body to fight against disease:

        A   Enzyme
        B   Microbes
        C   Bacterium
        D   Antibody

1.1.6   Connective tissue that reduces friction between bones:

        A   Cartilage
        B   Tendon
        C   Ligament
        D   Blood

1.1.7   The tendency of liquids to move up narrow tubes is called …

        A   capillarity.
        B   transpiration.
        C   root pressure.
        D   transpiration pull.

1.1.8   A hydrostatic skeleton is most likely to be found in the following animals, except in a/an …

        A   millipede.
        B   flatworm.
        C   jelly fish.
        D   earthworm.   (8 x 2)   (16)

1.2   Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1–1.2.7) in the ANSWER BOOK.

1.2.1   The mineral required to maintain osmotic balance in plants

1.2.2   A change in the structure of a protein as a result of high temperatures

1.2.3   Living material found in plant and animal cells

1.2.4   Plastids that store food in plant cells

1.2.5   Permanent tissue that lines the surfaces of roots, stems and leaves

1.2.6   The body's ability to manufacture antibodies to fight diseases

1.2.7   Loss of water from the margins of leaves   (7 x 2)   (14)

1.3 Indicate whether each of the statements in COLUMN I applies to **A ONLY**, **B ONLY**, **BOTH A AND B** or **NONE** of the items in COLUMN II. Write **A only**, **B only**, **both A and B**, or **none** next to the question number (1.3.1–1.3.7) in the ANSWER BOOK.

COLUMN I		COLUMN II	
1.3.1	Increases the absorption of calcium in the body	A:	Vitamin A
		B:	Vitamin D
1.3.2	Active transport of substances into and out of the cell	A:	Osmosis
		B:	Diffusion
1.3.3	Dark-stained body in the nucleoplasm of a cell	A:	Nucleus
		B:	Nucleolus
1.3.4	Connects bone to bone	A:	Tendon
		B:	Ligament
1.3.5	Type of joint formed at the wrists	A:	Pivot
		B:	Ball and socket
1.3.6	Number of ribs joined to the vertebral column	A:	24
		B:	12
1.3.7	Force responsible for upward movement of water in plants	A:	Capillarity
		B:	Transpiration pull

(7 x 2)   (14)

1.4 Study the diagram below of the Lock and Key Theory of enzymes. Answer the questions that follow.


[Source: https://www.quora.com]
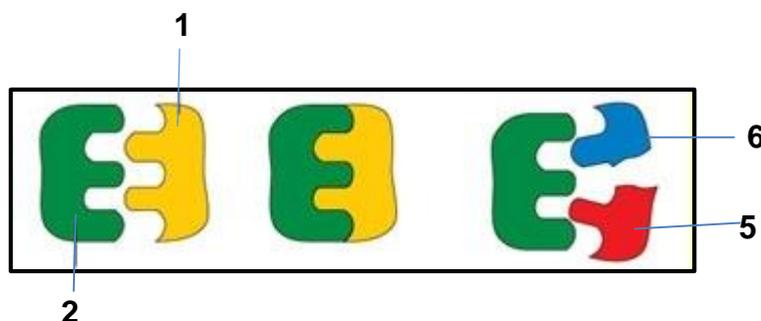
1.4.1 What is the function of an organic catalyst? (2)

1.4.2 What is the function of the enzyme, protease, in washing powders? (2)

1.4.3 If structure **1** represents maltose and structure **2** maltase, identify products **5** and **6**. (2)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1   Study the electron micrograph of a typical cell below and answer the
       questions that follow.
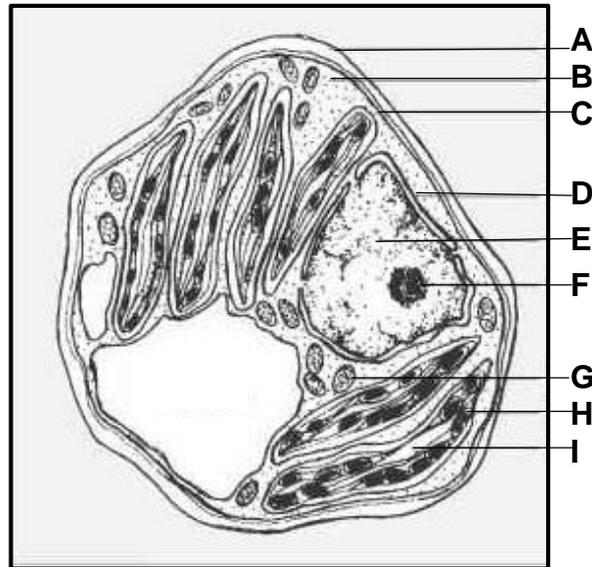
2.1.1   Provide labels for **B** and **E**.   (2)

2.1.2   Give the LETTER of the organelle that:

(a)   Controls the activities of the cells   (1)
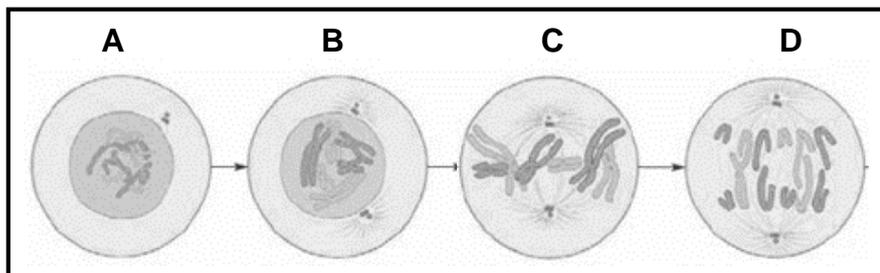
(b)   Protects the inner contents of the cell   (1)

(c)   is the site of photosynthesis   (1)

2.1.3   Describe the main structural features of organelle **G**.   (2)

2.1.4   Tabulate TWO differences between plant and animal cells.   (5)

2.2   The diagrams below show different phases of mitosis.

2.2.1   Identify phases **A**, **B**, **C** and **D**   (4)

2.2.2   List the main events that occur during phase **D**.   (3)

2.2.3   Briefly describe the biological importance of mitosis. (2)

2.2.4   Give one difference in telophase between plant and animal cells. (2)

2.2.5   Cancer is described as the uncontrollable division of cells.

    (a)   List THREE causes of cancer. (3)

    (b)   List ONE type of treatment used for cancer. (2)

2.3   Study the diagram below of the cross section of a dicotyledonous leaf. Answer the questions that follow.
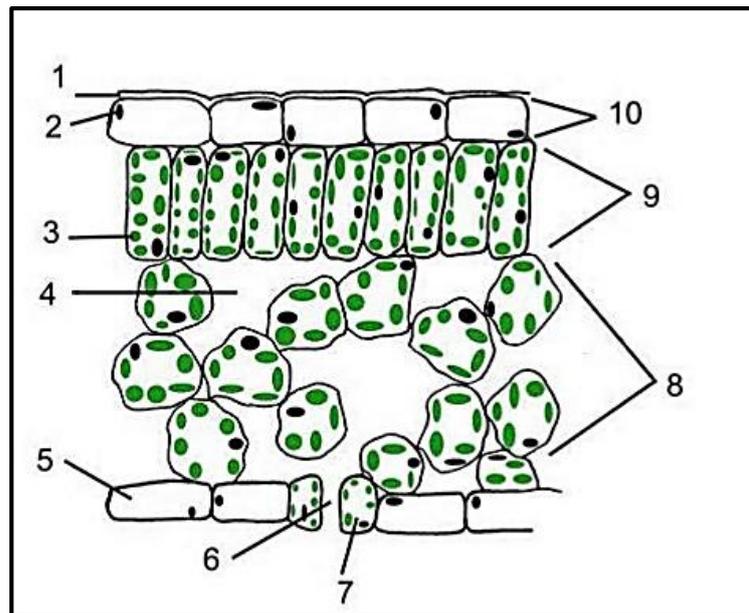
2.3.1   Provide a labels for **1**. (1)

2.3.2   List ONE function of structure **1**. (1)

2.3.3   Xylem is a conducting tissue found in leaves. List THREE structural features of xylem that allows it to perform its function. (3)

2.4 Study the food label below and answer the questions that follow.

NUTRITIONAL INFORMATION
Servings per package: 8
Serving size: 47,5 g (1 sausage)

Average values	Per 100g	Per sausage
Energy	**580 kJ** **(138 kcal)**	**276 kJ** **(65 kcal)**
Fat, Total	7 g	3,3 g
- Saturated	0,9 g	0,4 g
- Monosaturated	1,7 9	0,8 g
- Polyunsaturated	4,4 g	2,1 g
Carbohydrate	10,0 g	4,8 g
Of which sugar	1,3 g	0,6 g
Fibre	4 g	1,9 g
Protein	16,5 g	7,8 g
Sodium	800 mg (0,8 g)	380 mg (0,38 g)

2.4.1 What is the protein content of ONE sausage? (1)

2.4.2 List TWO functions of proteins in a diet. (2)

2.4.3 Would you consider this product a healthy choice in terms of fat content? Give ONE reason for your answer. (2)

2.4.4 Calculate the total amount of sodium if three sausages were eaten. (2)

[40]

QUESTION THREE

3.1   Study the diagram of a region of the human skeleton. Answer the questions that follow.
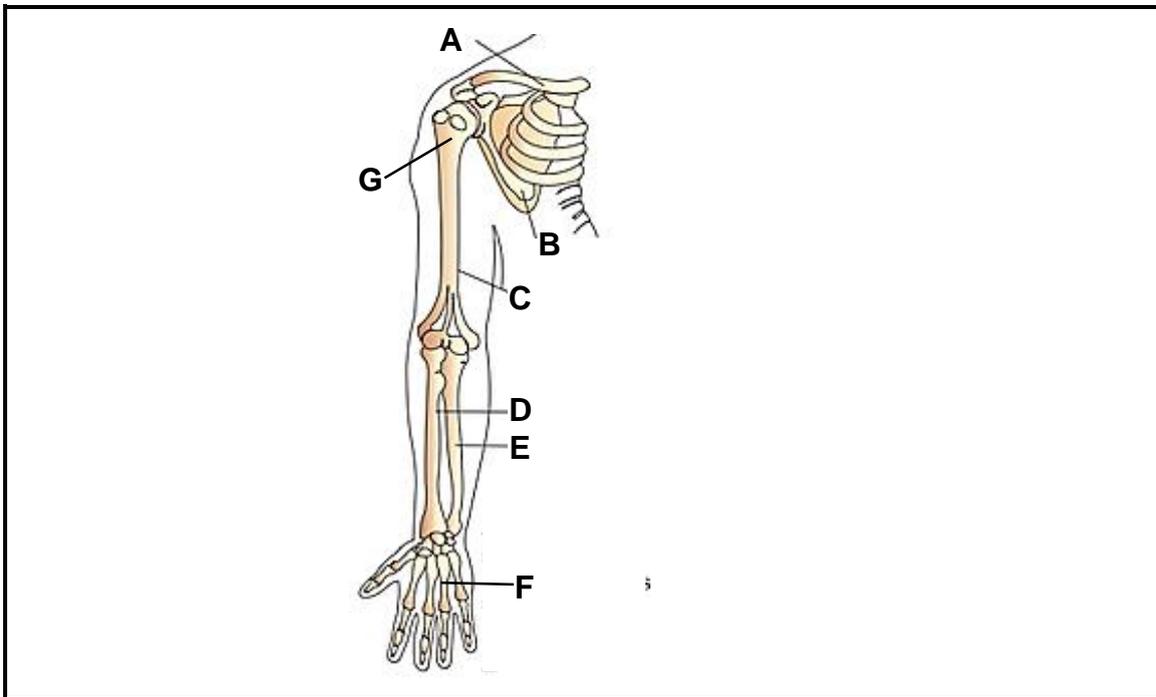
[Source: www.pinsdaddy.com]

3.1.1   List TWO functions of the skeleton.   (2)

3.1.2   Give the LETTERS of the bones that make up the pectoral girdle.   (2)

3.1.3   Synovial joints are freely moveable joints that assist with movement. Draw and label a diagram of a typical synovial joint.   (5)

3.1.4   Give the LETTER of a synovial joint in the diagram above.   (1)

3.1.5   Two sets of muscles are attached to the front and back of the humerus respectively.

    3.1.5.1   Name these TWO muscles.   (2)

    3.1.5.2   Name the substance that builds and repairs muscle tissue.   (2)

    3.1.5.3   Describe how these muscles function to bring about movement.   (3)

    3.1.5.4   Predict what would happen if the muscle attached to the back of the humerus cannot function.   (1)

3.1.6   List TWO diseases that affect the skeleton.   (2)

3.2   Zandile set up the following apparatus to investigate how temperature affects transpiration rate.
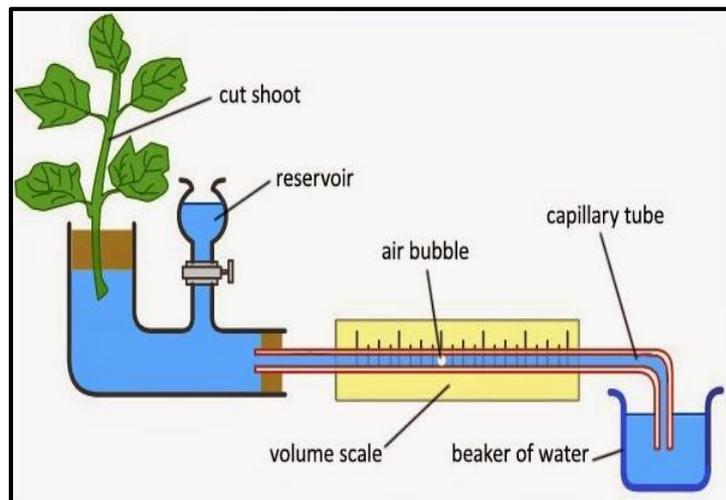
3.2.1   What is the name of this apparatus?   (1)

3.2.2   Give ONE precaution you would take when setting up this apparatus.   (2)

3.2.3   Predict what would happen to the speed of movement of the air bubble if Vaseline was applied to the ventral surfaces of all the leaves. Explain your answer.   (3)

3.2.4   Why should this apparatus be allowed to stand before starting the experiment?   (1)

3.2.5   Give a hypothesis for this experimental investigation.   (2)

3.2.6   Identify the:

       (a)   Dependent variable   (1)

       (b)   Independent variable   (1)

3.2.7   The potometer was used to investigate the effect of temperature on transpiration rate. Study the results in the table below.

Temperature °C	22	25	27	28	30
Transpiration rate (m mol/m² sec)	1,5	3,5	5	4,5	4

            Draw a line graph to illustrate these results.   (7)

3.2.8   What can you conclude about the relationship between temperature and transpiration rate?   (2)

                                                                         [40]

                                               TOTAL SECTION B: **80**

SECTION C

QUESTION 4

4.1   Stem cell research has made a significant contribution to the medical field. Evaluate this statement by describing what are stems cells, where they are harvested, their uses and the ethical issues associated with them.

> **NOTE**:   NO marks will be awarded for answers in the form of flow charts, tables or diagrams.

<div align="right">

Content: **(17)**
Synthesis: **(3)**

TOTAL SECTION C: **20**
GRAND TOTAL: **150**

</div>