Hillcrest High School

Grade 10

Life Sciences Paper 1

November 2023

MARKS: 150

TIME: 2 ½ Hours

EXAMINER: Miss Blom

MODERATORS: Mrs Harmse & Mrs Prior

Instructions:

1. Answer ALL questions in the answer booklet provided.
2. Number your answers exactly as the questions are numbered.
3. Present your answers according to the instructions of each question.
4. Write neatly and legibly in blue or black ink.
5. Do ALL drawings in pencil and label in pen.
6. You may use a non-programmable calculator.

SECTION A

Question 1

1.1. Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.10) in the ANSWER BOOK, for example 1.1.11 D.

1.1.1. Which type of plant tissue is responsible for growth and cell division?

a) Meristematic tissue
b) Ground tissue
c) Vascular tissue
d) Epidermal tissue

1.1.2. Night blindness occurs as a result of a lack of…

a) Vitamin B
b) Vitamin C
c) Vitamin E
d) Vitamin A

1.1.3. The jelly-like substance that makes up most of the cell is called the…

a) Cytoplasm
b) Vacuole
c) Endoplasmic reticulum
d) Deoxyribonucleic acid

1.1.4. What tissue do osteocytes form part of?

a) Blood
b) Epidermis
c) Bone
d) Collenchyma

1.1.5. The vascular bundles in dicotyledonous plants are made up of…

a) Xylem, phloem, cambium, and sclerenchyma.
b) Xylem and phloem only.
c) Xylem, phloem and epidermis.
d) Phloem and sclerenchyma only.

1.1.6. Chromosomes make copies of themselves before mitosis so that after division:

a) Two chromosomes in the new cells are the same size.
b) Two new cells have the same number of chromosomes.
c) Two chromosomes can form pairs.
d) All of the above.

1.1.7. Which of the following is NOT part of the axial skeleton?

a) Scapula
b) Rib cage
c) Vertebrae
d) Skull

1.1.8. The…. comprises of neurons.

a) smooth muscle
b) nerve tissue
c) skeletal muscle
d) epidermal tissue

1.1.9. Cells in a leaf that do not contain chloroplasts

a) Sclerenchyma cells
b) Palisade cells
c) Guard cells
d) Parenchyma cells

1.1.10. Which process occurs during secondary thickening of the dicotyledonous stem?

a) Formation of vascular bundles
b) Formation of cork
c) Formation of guard cells
d) Formation of a stele.

(10x2)
(20)

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 to 1.2.8) in your ANSWER BOOK.

1.2.1 Tumours that continue growing and invade important organs.

1.2.2 The edge of the leaf, which may be serrated, lobed or smooth.

1.2.3 Permanent structural change to a protein which affects its functioning.

1.2.4 Parenchyma tissues grouped together to cover and protect the tip of the root.

1.2.5 Fluid that prevents friction at the joints.

1.2.6 Disease caused by a lack of iron in the body.

1.2.7 Movement of water molecules from higher to lower concentration through a permeable membrane.

1.2.8 Opening on the underside of the skull through which the spinal cord leaves.

1.2.9 The drooping of stems and leaves as a result of plant cells becoming flaccid.

1.2.10 Waxy layer on the surface of a leaf.

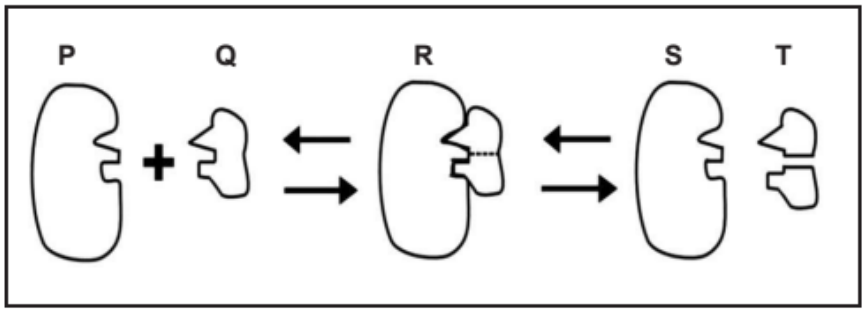
(10x1) **(10)**

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 to 1.3.4) in the ANSWER BOOK.

Column I	Column II
1.3.1. Present in woody stems only	A. Lenticels B. Guard cells
1.3.2. Muscle tissue found in voluntary muscles	A. Smooth B. Striated
1.3.3. Contains carbon, hydrogen and oxygen.	A. Carbohydrates B. Lipids
1.3.4. A type of cancer	A. Carcinoma B. Sarcoma
1.3.5. Component of a microscope that regulates the amount of light entering	A. Iris Diaphragm B. Stage clip

(5x2) **(10)**

1.4. Study the diagram below and answer the questions that follow.



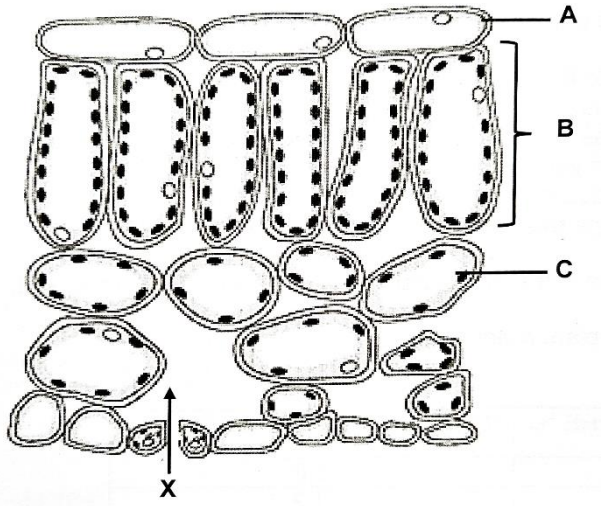
1.4.1 Label **P**, **Q** and **T**. (3)

1.4.2 The diagram above is based on a theory. Name the theory that is represented in the diagram above. (1)

1.4.3 Name TWO factors that could change the shape of P. (1)

(5)

1.5. The diagram below shows the internal structure of a leaf. Study the diagram and answer the questions that follow.



1.5.1 Identify:

a) Tissue **A** (1)

b) Gas **X** (1)

c) Tissue **B** (1)

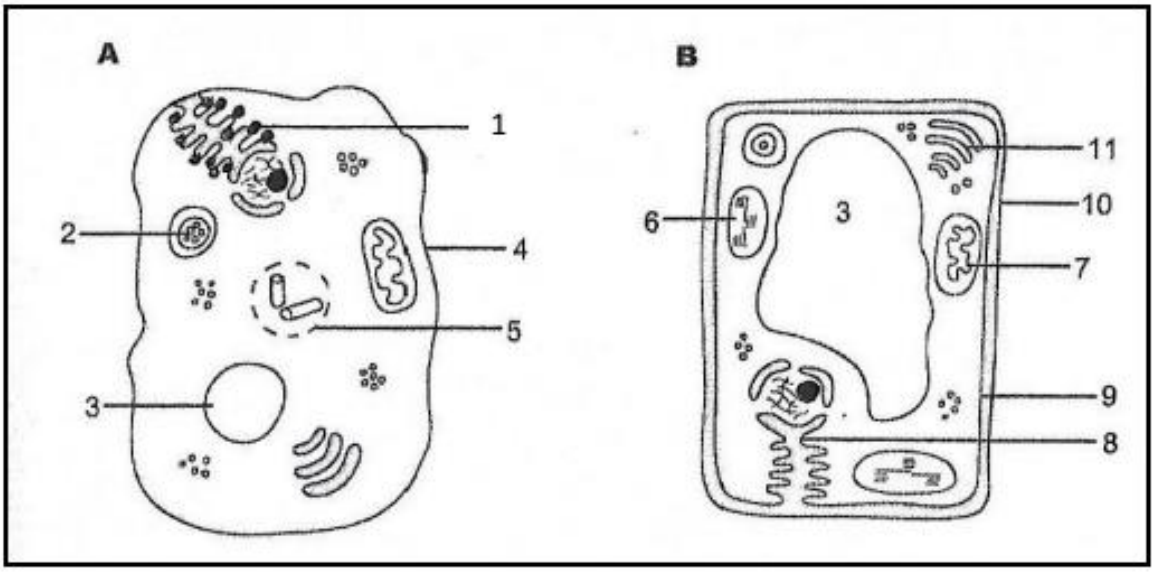
1.5.2 State TWO visible differences between tissue **A** and tissue **B.** (2)

(5)

SECTION B

QUESTION 2

2.1. Study the diagrams below and answer the questions that follow.



2.1.1 Which diagram, **A** or **B**, represents a plant cell? (1)

2.1.2 Give THREE visible reasons for your choice in 2.1.1. (3)

2.1.3 Write down the number of the part that is associated with:

(a) photosynthesis (1)

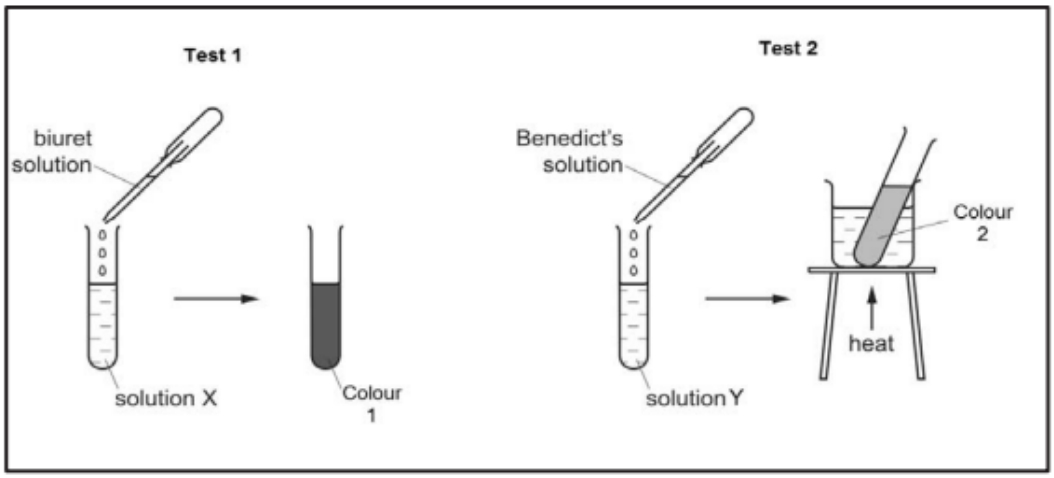
2.1.4 Identify the parts numbered **3** and **11**. (2)

2.1.5 Name structure 4 and explain the main function of this structure. (3)

2.1.6 Draw a labelled diagram of organelle 7. (4)

(14)

2.2. A group of Grade 10 learners conducted an experiment to test for the presence certain nutrients. They used egg white, glucose solution, starch powder solution as well as olive oil. The apparatus was set up as indicated below.



2.2.1 State the aim of Test 1. (1)

2.2.2 Identify which of the test samples are present in the following:

a) Solution X (1)

b) Solution Y (1)

2.2.3 If test 1 is positive, indicate what colour 1 will be. (1)

2.2.4 If test 2 is positive, indicate what colour 2 will be. (1)

2.2.5 Give TWO precautionary measures that should be taken into consideration when setting up the above apparatus. (2)

2.2.6 List any THREE steps that were followed in planning the experiment above. (3)

2.2.7 Provide TWO functions of the compound tested for in Test 1 (2)

(12)

2.3. Study the table below which shows the composition of certain food types in the human diet per 100g units and answer the questions that follow.

Food Type	**Energy (kJ)**	**Carbo-hydrates (g)**	**Proteins (g)**	**Fats (g)**	**Calcium (mg)**	**Iron (mg)**	**Vit A (µg)**	**Vit C (µg)**
Apple	217	14	0.3	0.2	6	0.1	3	4.6
Beef	820	0	21	12	16	1.6	5	0
Bread	995	44	11	2.2	684	4.9	0	0
Yoghurt	443	5.73	7.49	6.17	189	0.24	90	0
Cheese	1686	3.4	23	33	701	0.1	337	0.1

2.3.1 Name the food type that provides the most energy. (1)

2.3.2 Name the food type most effective for:

a) growth and development (1)

b) preventing bleeding gums (1)

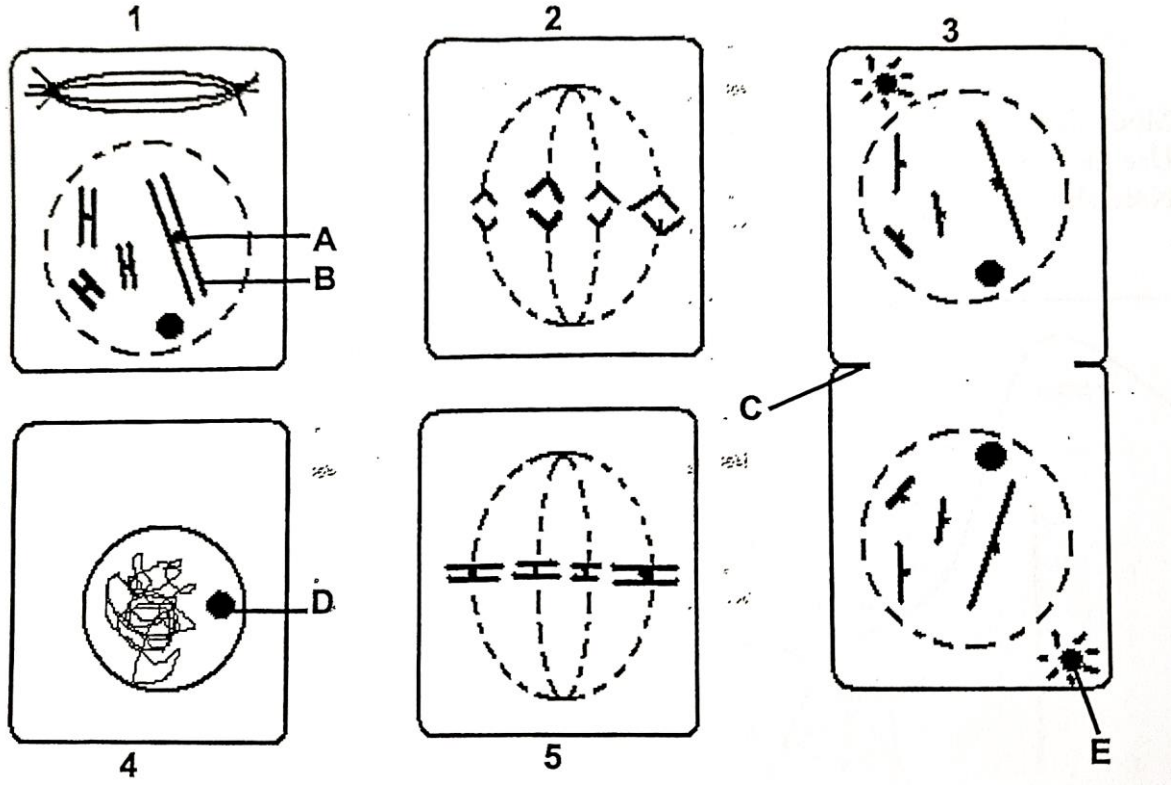
2.3.3 Draw a BAR GRAPH showing the amount of fats in 100g of each food type. (4)

2.3.4 The recommended daily allowance of iron is 18 mg/per day. Calculate the percentage of iron that comes from a 100 g serving of bread.

SHOW ALL WORKING (3)

(10)

2.4. Study the diagrams below and answer the questions that follow.



2.4.1 Label structures **A** and **E**. (2)

2.4.2 By making use of the NUMBERS ONLY, arrange the phases into the correct sequence. (5)

2.4.3 Write down the number of chromosomes in a daughter cell at the end of the process shown above. (1)

2.4.4 State ONE difference between plant and animal cells with regard to the process taking place at **C**. (2)

2.4.5 State TWO reasons why mitosis is biologically important (2)

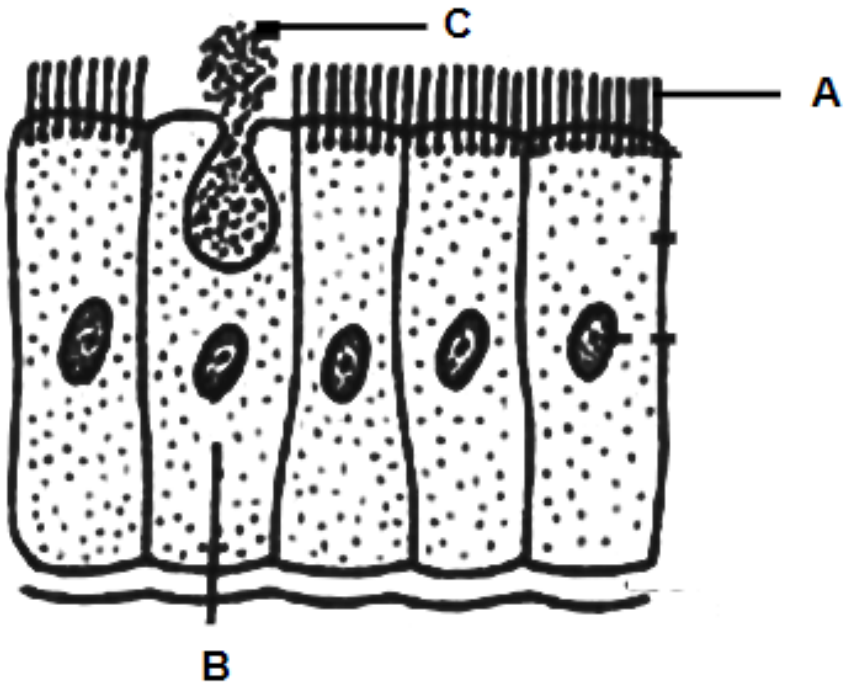
2.4.6 a) Identify the phase in diagram 5. (1)

b) Explain what happens in this phase. (1)

(14)

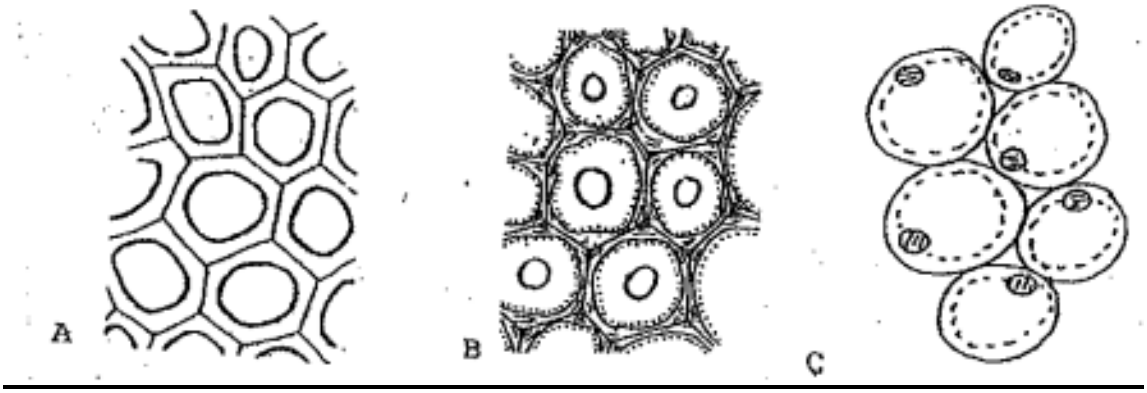
QUESTION 3

3.1. The diagram below represents a type of animal tissue.



3.1.1	Identify the tissue above.	(1)
3.1.2	Label cell **B**	(1)
3.1.3	Give the LETTER of the part that traps dust particles in the above tissue.	(1)
3.1.4	Explain TWO ways in which the tissue mentioned in QUESTION 3.1.1 is structurally suited to perform its function.	(4)
		(7)

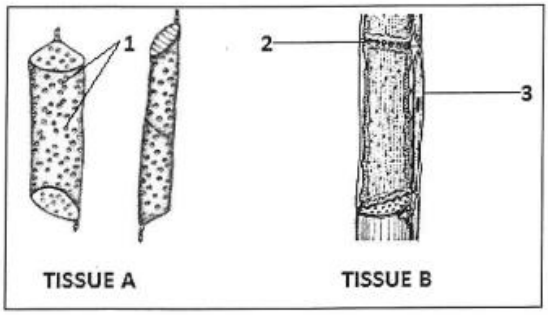
3.2. The diagrams below represent different tissues.



3.2.1	Identify tissue **A**, **B** and **C**.	(3)
3.2.2	Tabulate TWO structural differences between tissue **A** and **C**	(5)
3.2.3	In what type of organism, plant or animal, are you most likely to find these tissues?	(1)
3.2.4	Write down the function of tissue **C**.	(1)
		(10)

3.3	Define transpirational pull and explain the movement of water from the root to the leaf.	**(6)**

3.4 The diagrams below represent plant tissues that play a role in transport.



3.4.1 Identify tissue A (1)

3.4.2 Provide labels for:

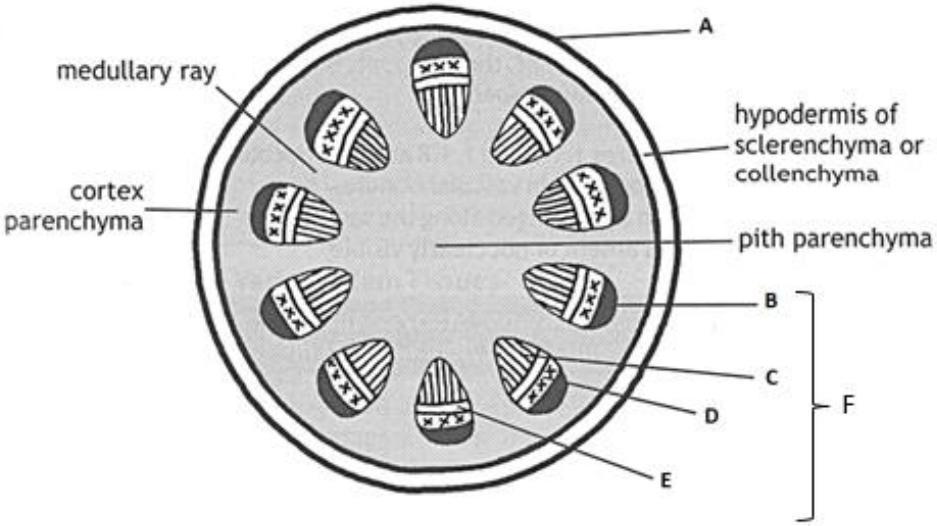
3.4.3 a) part labelled **2** (1)

b) cell labelled **3** (1)

3.4.4 State the function, other than transport, of tissue A. (2)

(5)

3.5 Study the diagram below and answer the questions that follow.



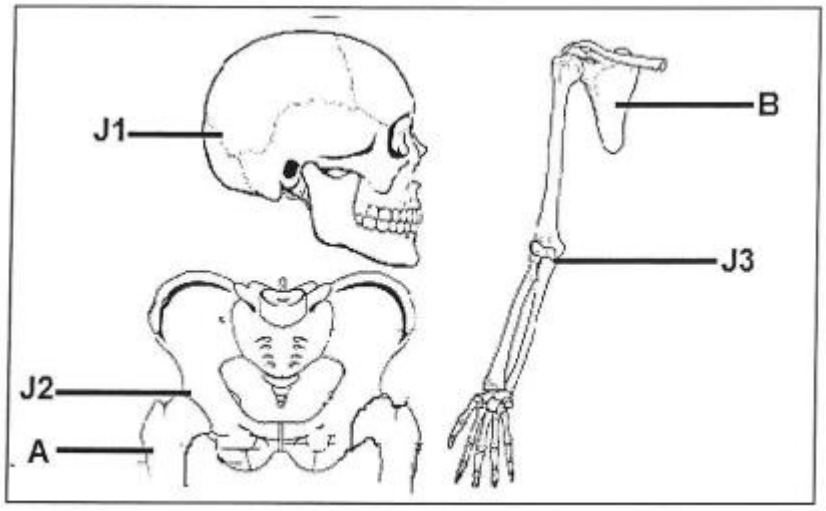
3.5.1 a) Identify the plant organ represented by the diagram above. (1)

b) Provide TWO visible reasons for your answer. (2)

3.5.2 Provide labels for parts B, C, and E. (3)

(6)

3.6 Study the diagrams below and answer the questions that follow.



SKELETON Y

3.6.1 Identify parts labelled **A** and **B** respectively. (2)

3.6.2 The parts labelled **J1**, **J2** and **J3** represent joints.

a) Name the synovial joints at **J2** and **J3** respectively. (2)

b) State clearly how **J1** differs from **J2** and **J3**. (2)

3.6.3 Name the tissue that prevents friction at **J2** and explain how this tissue is adapted to its function. (3)

3.6.4 Name the part of the appendicular skeleton that **B** forms part of. (1)

(10)

3.7 There are three different skeleton systems found in living organisms. NAME and DESCRIBE each one. **(6)**

[SECTION B = 100 MARKS]

TOTAL = SECTION A [50] + SECTION B [100]

= 150 MARKS