education

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PROVINCIAL ASSESSMENT

GRADE 10

LIFE SCIENCES P1

NOVEMBER 2019

MARKS: 150

TIME: 2 ½ hours

This question paper consists of 12 pages.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in the ANSWER BOOK.
3. Start the answers 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. Make 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 must use a non-programmable calculator, protractor and a compass, where necessary.
11. Write neatly and legibly.

SECTION A

QUESTION 1

1.1 Various possible options are provided as possible answers to the following questions. Choose the answer and write only the letter (A – D) next to the question number (1.1.1 to 1.1.9) in the ANSWER BOOK, for example 1.1.10 D.

1.1.1 Companion cells are part of …

A xylem.
B parenchyma.
C collenchyma.
D phloem.

1.1.2 Which bone does not fit the others?

A Carpals
B Metacarpals
C Ulna
D Fibula

1.1.3 An organelle that contains the genetic information of an organism.

A Chloroplast
B Mitochondrion
C Nucleus
D Centrosome

1.1.4 Which ONE of the following can be classified as animal tissue?

A Liver
B Blood
C Heart
D Stomach

1.1.5 The … comprises of neurons .

A cardiac muscle
B smooth muscle
C skeletal muscle
D nerve tissue

1.1.6 Tracheids form part of …

A xylem.
B sclerenchyma.
C sieve tubes.
D parenchyma.

1.1.7 Cells in a leaf that do not contain chloroplasts.

A Guard cells
B Sclerenchyma cells
C Palisade cells
D Parenchyma cells

1.1.8 Kwashiorkor is a deficiency disease of …

A proteins.
B vitamin A.
C vitamin B.
D fats/lipids.

1.1.9 The bones of the wrist are called the …

A tarsals.
B metatarsals.
C carpals.
D phalanges.

(9 x 2) **(18)**

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 1.2.10) in your ANSWER BOOK.

1.2.1 The temperature at which an enzyme functions best

1.2.2 The outermost cell layer in plants

1.2.3 The part of the microscope that provides a source of natural light

1.2.4 The growth in thickness of the stem in dicotyledonous plants

1.2.5 Openings on a leaf that allow gases to pass through

1.2.6 The liquid which prevents friction in a joint

1.2.7 Plant tissues which are already differentiated to perform specific functions

1.2.8 The longest bone in the body of humans

1.2.9 The body's ability to produce antibodies to fight diseases

1.2.10 Undifferentiated, actively dividing tissues in plants

(10)

1.3 Indicate whether each of the descriptions 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 1.3.7) in the ANSWER BOOK.

COLUMN I	COLUMN II
1.3.1 Attaches a muscle to a bone	A: Tendon B: Ligament
1.3.2 Carries impulses from the central nervous system to muscles and glands	A: Sensory neuron B: Motor neuron
1.3.3 Forms part of the stele/vascular bundles	A: Epidermis B: Endodermis
1.3.4 Provides turgidity to a cell	A: Cell wall B: Vacuole
1.3.5 Type of skeleton in reptiles, birds and mammals	A: Endoskeleton B: Exoskeleton
1.3.6 Cells in which photosynthesis occur	A: Guard cells B: Spongy parenchyma
1.3.7 The tissue that is found immediately below the upper epidermis of leaves	A: Palisade mesophyll B: Spongy mesophyll

(7 x 2) **(14)**

1.4 Study the following table of data related to blood cells in blood samples of THREE different people and answer the questions that follow.

TYPE OF BLOOD CORPUSCLES	NUMBER PER mm^3 OF BLOOD		
	PETER	**JOHAN**	**SUZAN**
Erythrocytes/red blood cells	5 000 500	2 100 000	8 200 000
Leucocytes/white blood cells	6 100	5 100	510
Thrombocytes/platelets	100	255 000	249 000

1.4.1 (a) Which person is probably anaemic? (1)

(b) Give a reason for your answer. (1)

1.4.2 (a) Which person will probably have blood that does not clot very easily? (1)

(b) Give a reason for your answer. (1)

1.4.3 (a) Which person recently stayed high above sea level? (1)

(b) Give a reason for your answer. (1)

1.4.4 (a) Which person will easily become ill if he/she is exposed to a virus? (1)

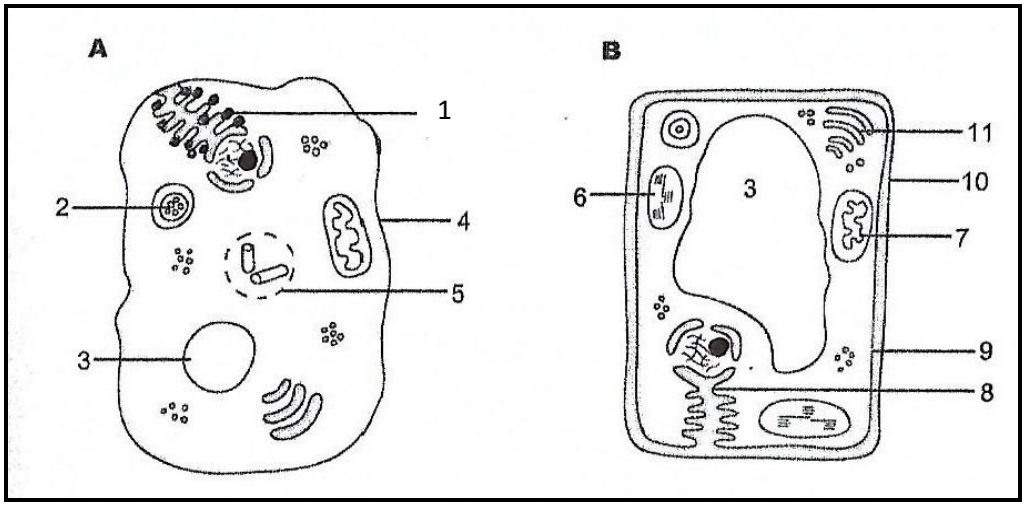
(b) Give a reason for your answer. (1)
(8)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 Study the following diagrams of cells 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 QUESTION 2.1.1 (3)

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

(a) protein synthesis. (1)

(b) photosynthesis. (1)

2.1.4 Identify the parts numbered **3**, **5** and **8** respectively. (3)

2.1.5 Explain why the organelle numbered **7** is referred to as the "*power house*'' of the cell? (2)

2.1.6 Make a neat labelled diagram of the part that controls all metabolic processes in the cell. (4)
(15)

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

FOOD TYPE	ENERGY (kJ)	PROTEIN (g)	FATS (g)	CARBO-HYDRATES (g)	CAL CIUM (mg)	IRON (mg)	VIT. A (µg)	VIT. C (µg)
Bacon	1983	18,0	52,0	0	15	0	0	0
Beans	376	7,0	0,4	22,0	65	2,4	298	0
Bread	1072	8,8	1,4	58,1	102	1,8	0	0
Butter	3230	0,2	87,3	0	1,7	0	2015	1,5
Milk	281	3,9	4,6	5,4	129	0,15	87	0,1

2.2.1 (a) Which food type supplies the best overall nutrition to the body? (1)

(b) Give a reason for your answer in QUESTION 2.2.1 (a) (1)

2.2.2 Which food type provides the **most** energy per serving? (1)

2.2.3 Which food type provides the **least** energy per serving? (1)

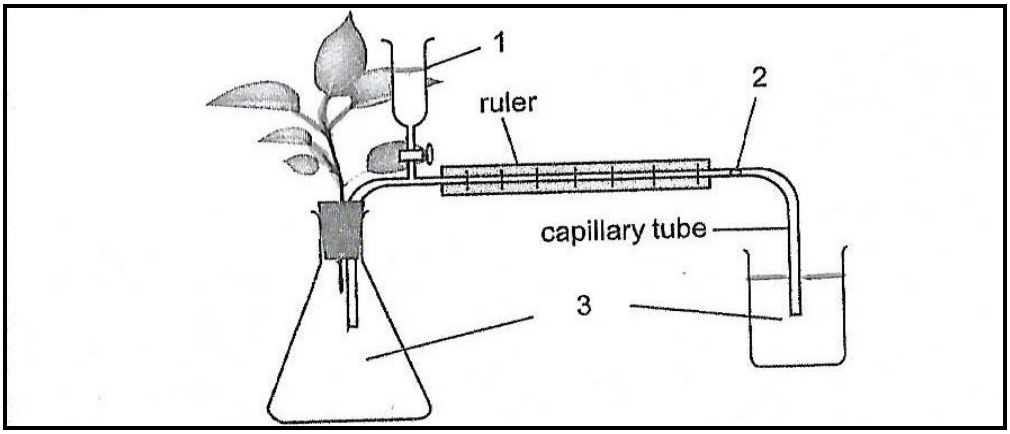
2.2.4 Which food type do you consider to be most effective for:

(a) preventing bleeding gums? (1)

(b) growth and development? (1)

2.2.5 The required dietary allowance of iron per day is 18 mg. Calculate the percentage iron which is provided by a 100 g serving of bread per day. **(Show all working)** (3)
(9)

2.3 The diagram below shows the apparatus that was set up in a laboratory. Study the diagram and answer the questions that follow.



2.3.1 Name the apparatus in the diagram above. (1)

2.3.2 What is this apparatus used for? (2)

2.3.3 Supply the labels to parts numbered **1**, **2** and **3** respectively. (3)

2.3.4 Explain how you could introduce part number **2** into the apparatus. (2)

2.3.5 List ONE precautionary measure you would take to set up the apparatus correctly. (1)

2.3.6 Mention ONE external factor that would have the same effect as wind on the above practical investigation. (2)
(11)

2.4 Read the following example of a process that refers to the movement of molecules and answer the questions that follow.

Thandi sprays some perfume in the corner of a small closed room. Jacob is standing in the middle of the room and Lerato is standing in the opposite corner.

2.4.1 Who will be able to smell the perfume first? Jacob or Lerato? (1)

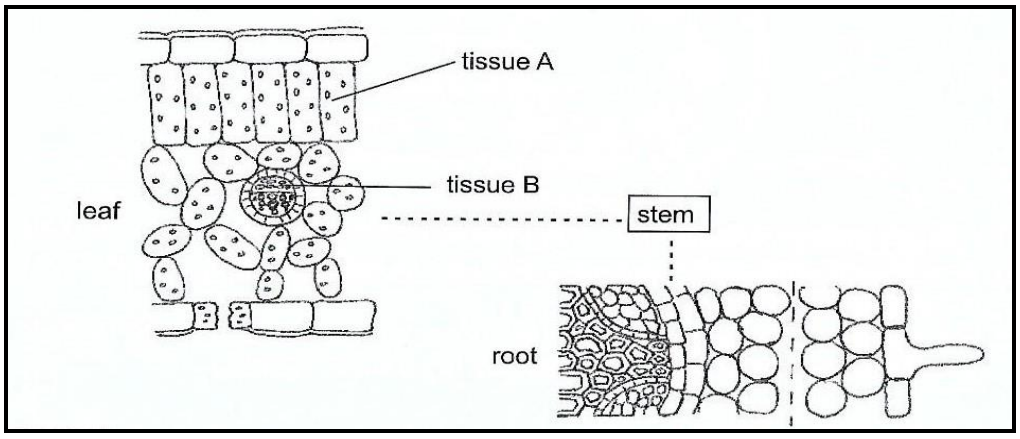
2.4.2 (a) Will the other learner eventually be able to smell the perfume? (1)

(b) Explain your answer in QUESTION 2.4.2 (a) (2)

2.4.3 Is the process mentioned in QUESTION 2.4.2 an active or a passive process? (1)
(5)
[40]

QUESTION 3

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



3.1.1 Explain ONE visible structural adaptation that assists the plant to prevent water loss. (3)

3.1.2 (a) Name the tissue that transports water from the root to reach the leaf. (1)

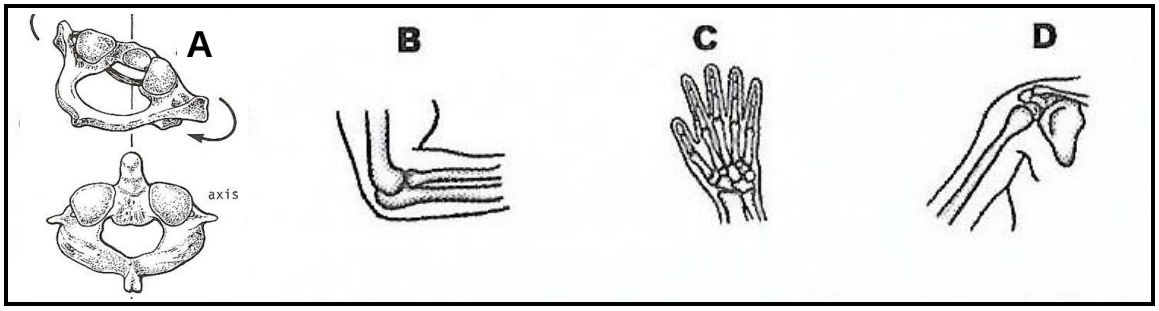
(b) Explain TWO ways how the tissue mentioned in QUESTION 3.1.2 (a) is structurally adapted to perform its function efficiently. (4)

3.1.3 Name the process for which tissue **A** is responsible. (1)

3.1.4 Name the process which causes water to move from the cytoplasm of one parenchyma cell to another, as it passes through the cortex of the root. (1)
(10)

3.2 Tabulate TWO structural differences between a dicotyledonous root and a dicotyledonous stem. **(5)**

3.3 Study the diagrams below representing different joints and answer the questions that follow.

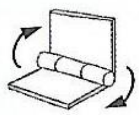
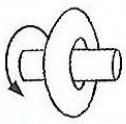
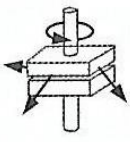


3.3.1 Identify the type of joint according to the movement they permit.

(a) A
(b) B
(c) C
(d) D (4)

3.3.2 Define the term; joint. (2)
(6)

3.4 The diagrams in Column **B** represent a type of synovial joint. Match the LETTERS (A to D) with the place in the human body (Column A) where the joint is found. E.g 3.4.5 E

COLUMN A	**COLUMN B**
3.4.1 Phalanges	A 
3.4.2 Carpals	B 
3.4.3 Humerus in glenoid cavity of pectoral girdle	C 
3.4.4 Radius and ulna	D 

(4 x 1) **(4)**

3.5 Bone and teeth are largely made of protein and calcium salts. The hardness of the material depends on the amount of calcium salts present. Dentine and enamel are the two materials which make up teeth.

In an investigation, scientists wanted to find out which part of the tooth is the hardest. The table below shows the amounts of calcium salts and protein in bone, dentine and enamel. Study the table of results and answer the questions that follow.

TYPE OF MATERIAL	**COMPOSITION (% DRY MASS)**	
	CALCIUM SALTS	**PROTEIN**
Bone	60	40
Dentine	80	20
Enamel	90	10

3.5.1 (a) Explain the conclusion of the investigation. (2)

3.5.2 From the table, identify the:

(a) independent variable. (1)

(b) dependent variable. (1)

3.5.3 Use the data in the table to draw a bar graph. (6)
(10)

3.6 Some washing powders are described as having 'biological' action because they contain enzymes. These powders are particularly useful for removing stains such as blood, egg, chocolate and gravy. The manufacturers suggest that such washing powders are most effective in lukewarm water, rather than cold or boiling water.

3.6.1 Give a reason why the biological washing powders are more effective to remove the stains mentioned above, than ordinary washing powders (1)

3.6.2 At which temperature (in ˚C) would you say the lukewarm water must be for the best results? (1)

3.6.3 Explain why manufacturers suggest that biological washing powders are less effective at high temperatures. (2)

3.6.4 Suggest ONE reasons why biological washing powders are more economical than ordinary washing powders. (1)
(5)
[40]

TOTAL SECTION B: 80

SECTION C

QUESTION 4

Describe what cancer is and distinguish between TWO types of tumours. Discuss the causes and treatment of cancer.

Content: (17)
Synthesis: (3)
(20)

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

TOTAL SECTION C: 20
GRAND TOTAL: 150