

+ Memo

Hillcrest High School

Time: 2½ hours

November 2017
Max. Marks: 150

Gr. 10 Life Science PAPER 1



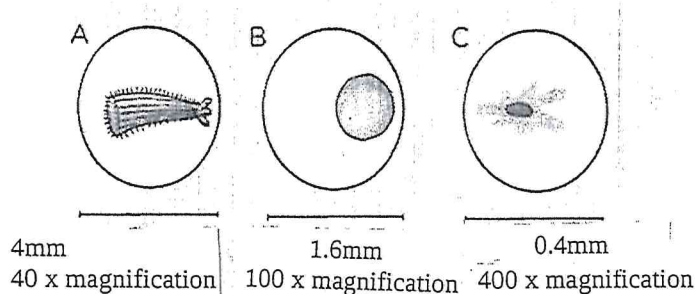
Instructions:

1. Write your Life Science teachers name on your answer booklet.
2. Number the answers exactly as the questions are numbered.
3. Write neatly and legibly.
4. Do all drawings in pencil and label them in ink.
5. Only draw diagrams and flow charts when requested to do so.
6. The diagrams in the question paper may not necessarily be drawn to scale.
7. Non-programmable calculators, protractors and compasses may be used.

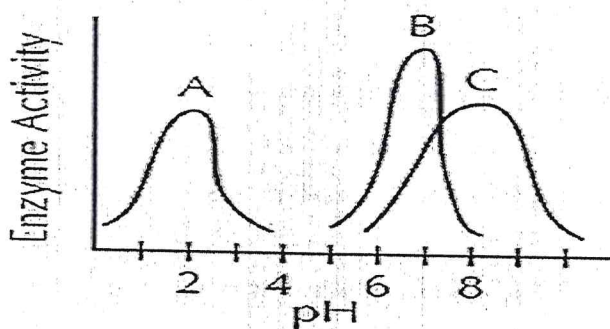
SECTION A:

QUESTION 1

- 1.1. Which one of the following is not a biological role of water:
- A. prevents deficiency diseases
 - B. dissolves biochemical compounds
 - C. provides a medium in which chemical reactions take place
 - D. involved in the hydrolysis of foodstuffs
- 1.2. Examine the 3 images below. Which organism would be the smallest when viewed with the naked eye?



- A. A would be the smallest
 - B. B would be the smallest
 - C. C would be the smallest
 - D. A and C would be the smallest
- 1.3. The graph below illustrates that enzymes:



- A. are pH specific
 - B. catalyses a specific substrate
 - C. are denatured at high pH
 - D. are denatured at low pH
- 1.4. Active transport is the movement of a substance from a:
- A. high concentration to a low concentration
 - B. high water potential to a low water potential
 - C. isotonic solution
 - D. low concentration to a high concentration
- 1.5. Tissues come together to form a/an
- A. organ
 - B. organ system
 - C. body system
 - D. organelle
- 1.6. What is the key difference between meristematic and permanent tissue?
- A. the ability to conduct photosynthesis
 - B. the ability to divide
 - C. the ability to move
 - D. the complexity to perform a function
- 1.7. The body structure of Vertebrates includes:
- A. Exoskeleton
 - B. Hydrostatic skeleton
 - C. Endoskeleton
 - D. Calcareous skeleton
- 1.8. Thando was shown two slides of plant tissues: parenchyma and sclerenchyma. Which of the features given below would be crucial in identifying sclerenchyma.
- A. location of nucleus
 - B. size of cells
 - C. thickness of cell walls
 - D. position of vacuoles
- 1.9. The lens of a microscope that is closest to the specimen being studied is the
- A. eyepiece lens
 - B. objective lens
 - C. condenser lens
 - D. diaphragm lens
- 1.10. The single membrane that covers the vacuole is called the
- A. cytosol
 - B. endoplasmic reticulum
 - C. lamella
 - D. tonoplast

(10×2marks = 20 marks)

Terminology:

- 1.2. Give the correct term for the following descriptions/definitions.
 - 1.2.1. The model that is used to describe the structure of the cell membrane.
 - 1.2.2. The division of the cytoplasm during mitosis.
 - 1.2.3. The organelle in the cell that is nicknamed 'the power-house'.
 - 1.2.4. The building blocks of carbohydrates.
 - 1.2.5. Conducting tissue that transports manufactured food.
 - 1.2.6. The part of the skull that contains and protects the brain.
 - 1.2.7. An organic catalyst that speeds up chemical change without being used in the reaction itself.
 - 1.2.8. The light-trapping pigment found in leaves.
 - 1.2.9. The name of the growth or lump that forms because of uncontrolled mitosis in the body.
 - 1.2.10. Type of muscle tissue found in voluntary muscles.

(10×1 mark = 10 marks)

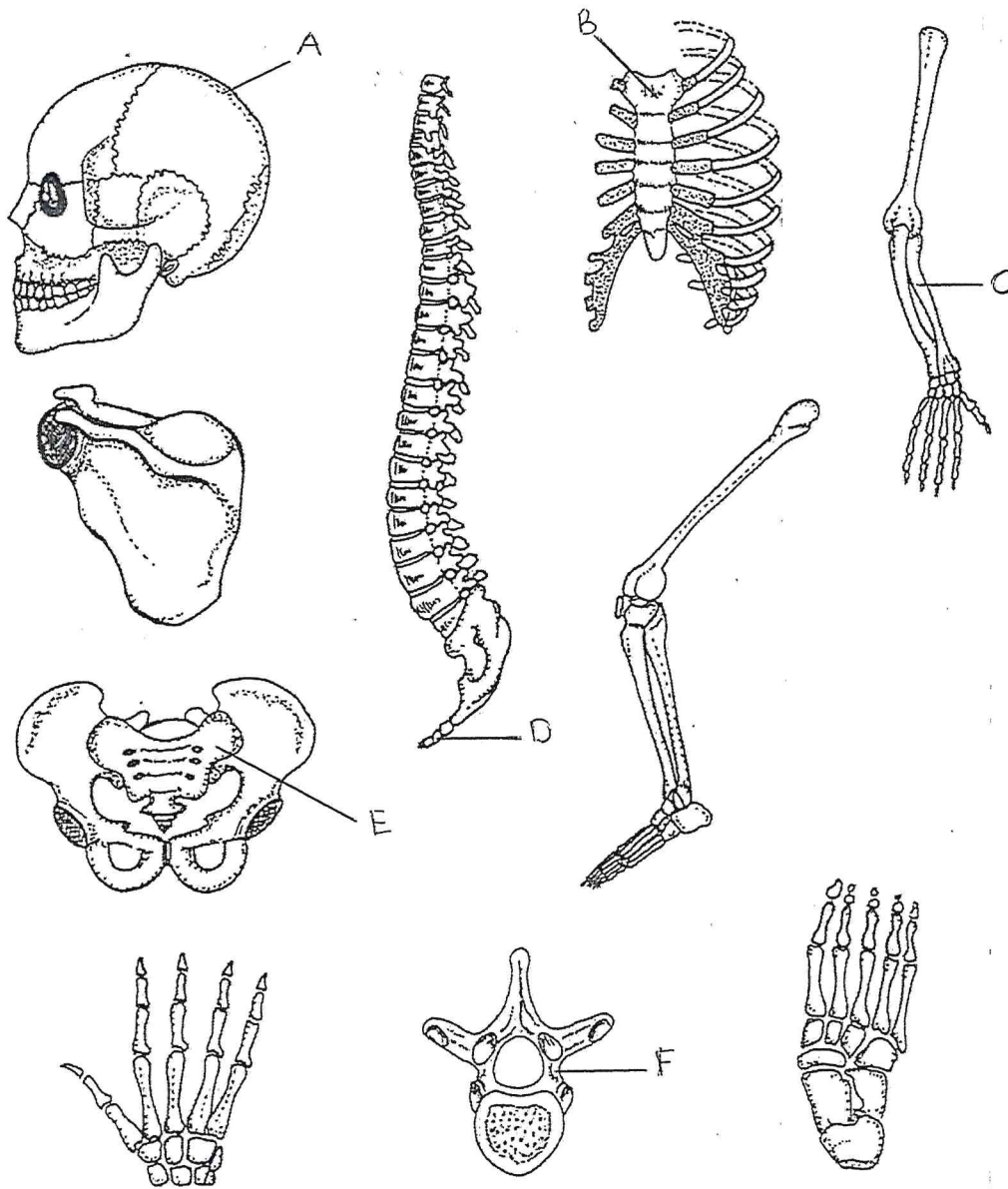
- 1.3. Indicate whether each of the statements in **COLUMN A** applies to **A ONLY, B ONLY, BOTH A and B, or NONE** of the items in **COLUMN B**.

Write **A ONLY, B ONLY, BOTH A and B, or NONE** next to the question number (1.3.1 to 1.3.6) in the answer book.

COLUMN A	COLUMN B
1.3.1. Deficiency in Iron	A. Kwashiorkor B. Goitre
1.3.2. Disaccharide compound	A. Lactose B. Glucose
1.3.3. Building blocks of proteins	A. Glycerol B. Amino acid
1.3.4. Enzyme activity is affected by:	A. Temperature B. pH levels
1.3.5. An example of Nucleic Acids	A. RNA B. DNA
1.3.6. Deficiency in Vitamin D	A. Rickets B. Scurvy

(6)

1.4. Look carefully at the different parts of the skeletal system below and answer the following questions.



- 1.4.1. Identify the parts labelled A, B, C, D, E and F. (6)
- 1.4.2. List 4 functions of this type of skeleton. (4)
- 1.4.3. Give an example of:
- a) a flat bone (1)
 - b) an irregular bone (1)
- 1.4.4. Briefly explain what osteoporosis is. (2)
- (14)

TOTAL SECTION A = 50 MARKS

SECTION B

QUESTION 2

2.1 Read the passage below and answer the questions that follow.

What's in a washing powder?

Modern washing powders contain a number of chemicals which reflect the complex demands of modern living. These detergents must remove stains without damaging fabrics and washing machines. They should also be environmentally friendly.

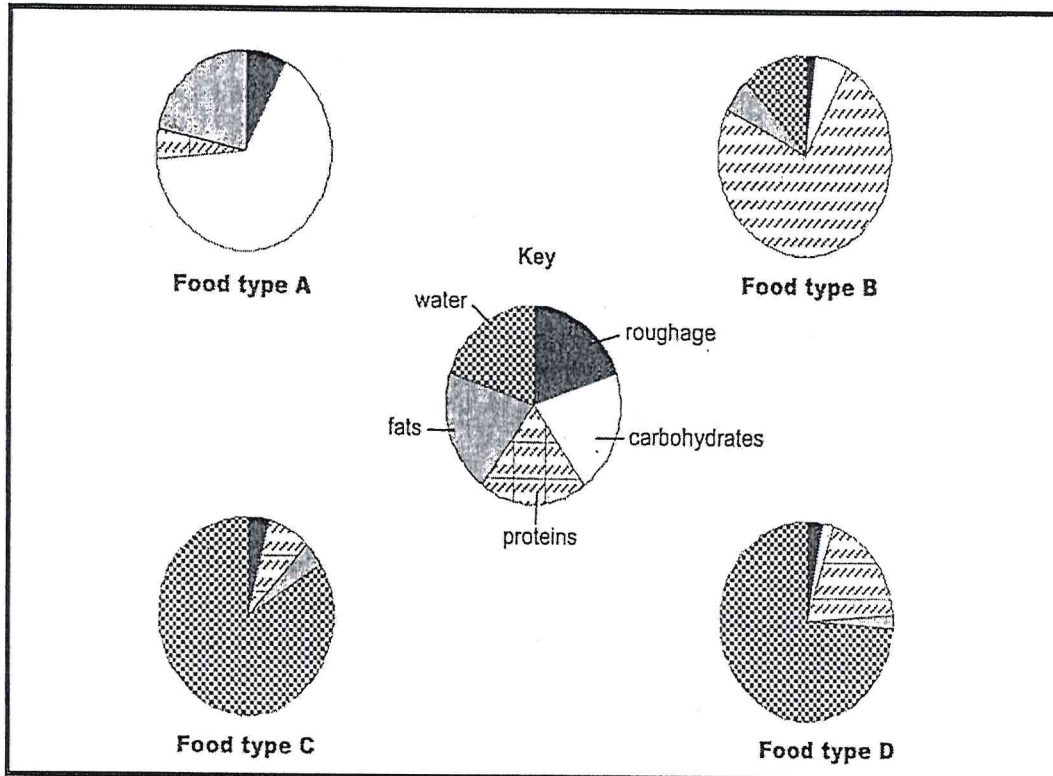
Most detergents contain surfactants which allow the water to spread across the fabric, and builders to soften the water. In addition, lather control agents are put in to stop too much froth forming. The pleasant smell of detergents is produced by fragrances. Corrosion inhibitors protect the washing machine from rusting.

Biological washing powders also contain several types of enzyme such as proteases, amylases and lipases. These enzymes are so powerful that the powders have only 1% enzymes.

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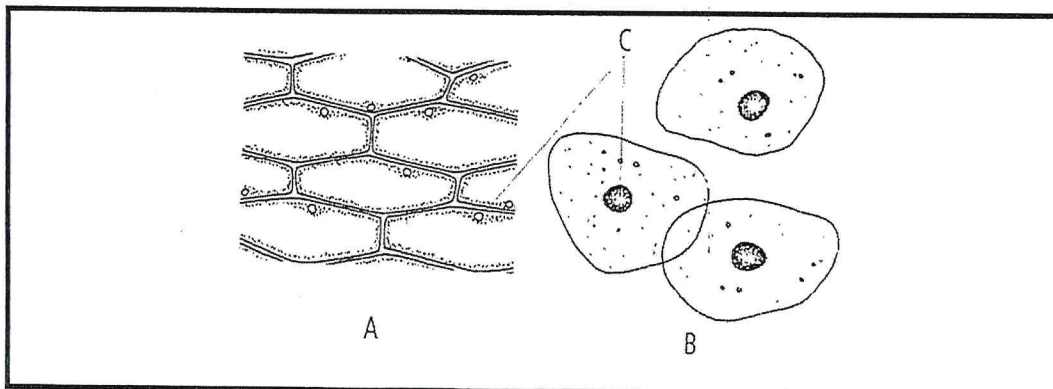
- 2.1.1 Name the substance in washing powders which prevents too much foam forming. (1)
- 2.1.2 Why are fragrances added to washing powders? (1)
- 2.1.3 Why do biological washing powders contain a very low percentage of enzymes? (1)
- 2.1.4 Name the three enzymes found in biological washing powders and state what they act on. (6)
- [9]

2.2 Study the pie charts and answer the questions that follow



- 2.2.1 Name the main component of food type B. (1)
- 2.2.2 List three functions of the component mentioned in Question 2.2.1. (3)
- 2.2.3 What type of food (A, B, C or D) will be the most beneficial to a person that lives in a very cold place such as Antarctica? Give a reason for your answer. (3)
- [7]

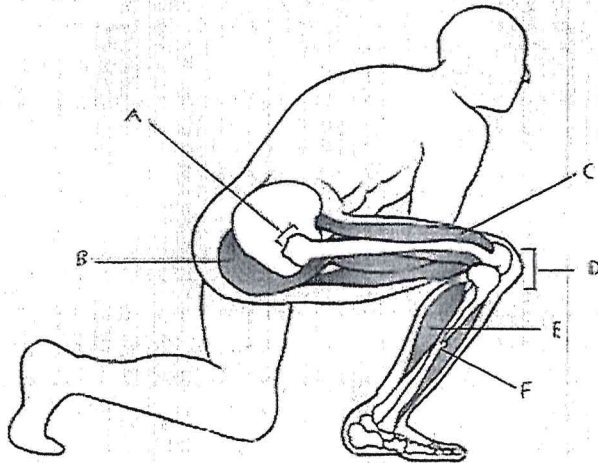
2.3 A Grade 10 learner submitted the following drawings of animal cells and plant cells, which he viewed under a light microscope. He forgot to label the drawings or to write a caption for them.



- 2.3.1 Which of the drawings (A or B) are:
- Plant cells?
 - Animal cells?
- (2)

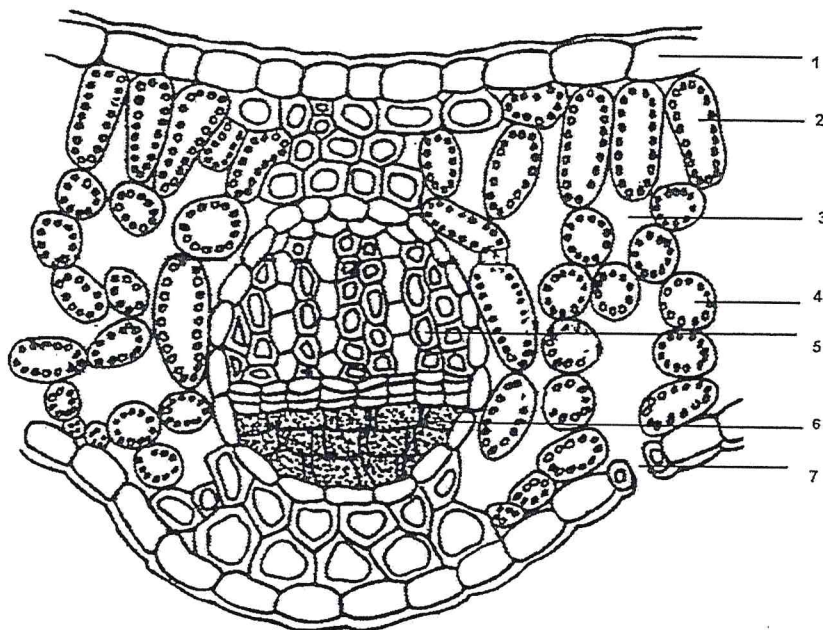
- 2.3.2 Tabulate two visible differences between cells A and cells B. (4)
- 2.3.3 List two visible similarities between Cells A and Cells B. (2)
- 2.3.4 Why do you think the learner did not draw structures like chloroplasts and mitochondria? (2)
- 2.3.5 Name part C and state its function. (2)
- [12]

2.4. The diagram below shows the legs of an athlete while he is waiting for a race to start. The letters A to F show some of the muscles as well as joints that will be used during the race.



- 2.4.1. The leg shown in the diagram has different types of joints. Which of the following letters (A to F) indicates:
- i) a hinge joint (1)
 - ii) a ball and socket joint (1)
- 2.4.2. During the race, the above athlete suffered an injury to his right knee that resulted in torn ligaments. Consequently, he was not allowed to participate in competitions for six weeks, and was only paid one third of his monthly income during this time.
- a) Do you think that athletes who are unable to take part in competitions due to injury should be entitled to their full income? Give a reason for your answer. (2)
 - b) After six weeks the athlete found out that the knee injury was permanent. He had surgery to fit in an artificial knee, which could perform better than his original knee. Suggest why he should not be allowed to participate in the competitions he took part in previously. (1)
-
- 2.4.3. State where hyaline cartilage can be found in the above diagram and give one function for hyaline cartilage. (2)
- [7]

2.5. Study the diagram of a leaf below and answer the following questions.



2.5.1. Provide labels for 1,2,3,4 and 7.

(5)

2.5.2. Explain two functions of the cuticle.

(2)

2.5.3. Where does the most photosynthesis take place? Give the label number only.

(1)

2.5.4. Name two substances that move through label No. 7.

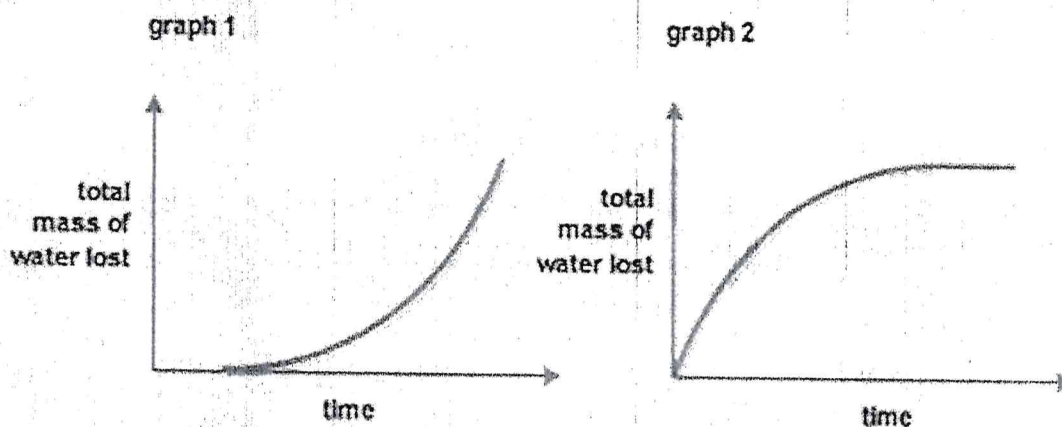
(2)

[10]

[Question 2 total = 45 marks]

QUESTION 3

3.1. Study the diagram below and answer the following questions.



- 3.1.1. Which graph could show water loss under increasing external humidity? (1)
- 3.1.2. Give a reason for your answer to Question 3.1.1. (2)
- 3.1.3. Describe how each of the following adaptations results in a decrease in the transpiration rate:
- a) Small, rolled leaves (1)
 - b) Thick waxy cuticle (1)
- 3.1.4. Name two environmental conditions that would increase transpiration. (2)
- 3.1.5. Explain what **transpiration pull** is. (3)
- [10]**
- 3.2. Using your Biological Drawing Rules, draw a Biological Drawing of a Root Hair (5)
- 3.3.1. Look at the Table below showing the structure and function of Parenchyma Tissue and Sclerenchyma Tissue then write out the functions for 3.3.1 to 3.3.3 in your answer booklet.

Parenchyma Tissue

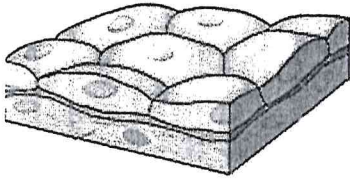
Structure	Function
Thin-walled cells.	Thin walls allow for close packing and rapid diffusion between cells.
Intercellular spaces are present between cells.	3.3.1.
Parenchyma cells have large central vacuoles.	3.3.2.
Some parenchyma cells retain the ability to divide	Allows replacement of damaged cells.

Sclerenchyma Tissue

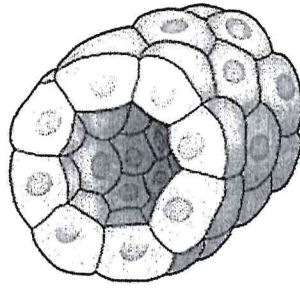
Structure	Function
Cells are dead and have lignified secondary cell walls.	3.3.3.
Sclereids have strong walls which fill nearly the entire volume of the cell.	Provide the hardness of fruits like pears. These structures are used to protect other cells.

(3)

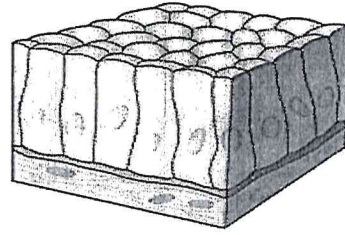
Study the following pictures of animal tissue and answer the following questions:



A



B



C

3.3.2. Identify the tissues labelled A to C.

(3)

3.3.3. **TISSUE C** contain specialized cells that secrete mucus.

a) Name this cell

(1)

b) Can also contain hair-like structures. Give the name for the hair-like structures.

(1)

3.3.4. Explain where you would find **TISSUE A** and give **ONE function**.

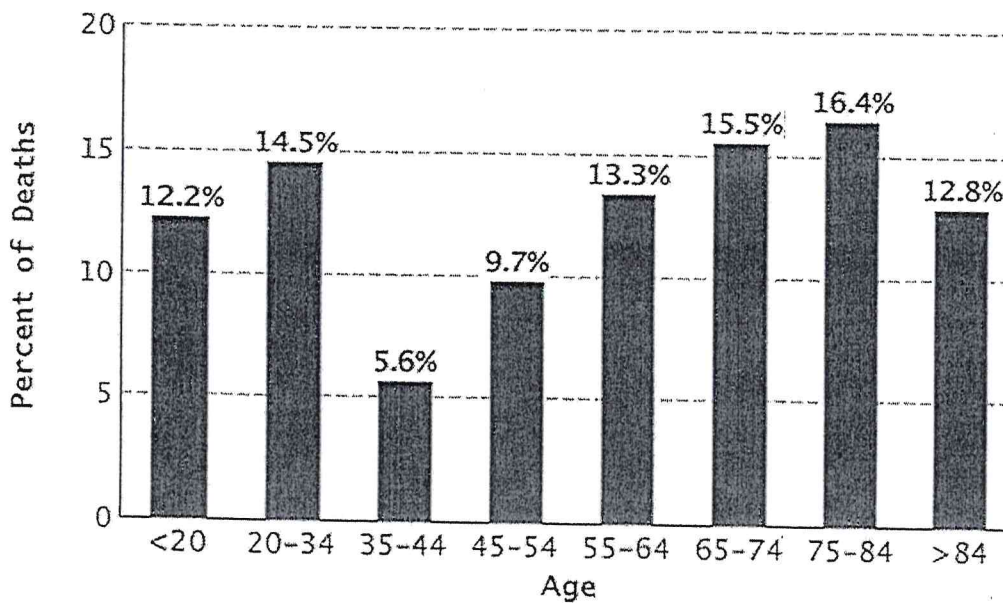
(2)

3.3.5. Explain where you would find **TISSUE B** and give **ONE function**.

(2)

[12]

3.4. Study the table below that shows the percentage of deaths in the different age groups due to bone cancer. Answer the following questions:



- 3.4.1. Convert the data on the above Bar Graph into a table. (4)
- 3.4.2. Provide a Conclusion for this Bar Graph. (1)
- 3.4.3. Name the Dependent Variable. (1)
- 3.4.4. Which age group had the second highest percentage of deaths? (1)
- 3.4.5. People over the age of 84 years showed a drop in the death rate. Give a possible reason. (1)

[8]

[Question 3 total = 35 marks]

SECTION C

QUESTION 4 – Essay

Write an essay on the process of mitosis. Your essay must include the following points:

- Events during Interphase (2)
- Events of the 4 phases of mitosis (12)
- Three biological importance of mitosis (3)

Content: 17 marks
Synthesis: 3 marks

*No marks will be awarded for answers in the form of flow charts or diagrams

[Total Section C = 20 marks]

GRAND TOTAL: 150 marks