

Phoenix North Cluster Life Sciences Committee

Final Examination- 2019

LIFE SCIENCES PAPER 1

GRADE 11

Marks - 150

Time - 2,5 hours

EXAMINER : MR. S. K MOODLEY (TRENANCE MANOR SECONDARY)

MODERATOR: MR V. RAMOTHAR (SOLVISTA SECONDARY)

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 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. Write neatly and legibly.
6. If answers are NOT presented according to the instructions of each question, candidates will lose marks.
7. ALL drawings should be done in pencil and labelled in blue or black ink.
8. Draw diagrams or flow charts only when requested to do so.
9. The diagrams in this question paper may NOT necessarily be drawn to scale.
10. The use of graph paper is NOT permitted.
11. Non-programmable calculators, protractors and compasses may be used
12. This question paper consists of 8 PAGES

SECTION A

QUESTION 1

1.1. Various possible options are provided as answers to the following questions. Choose the correct answer and write ONLY the LETTER (A-D) Next to the question number. Eg. 1.1. D

1.1.1. Light independent phase of photosynthesis occurs in the

- A. Matrix
- B. Stroma
- C. Grana
- D. Cristae

1.1.2. Reagent used to test for starch

- A. Benedict's solution
- B. Alcohol
- C. Millons
- D. Iodine solution

1.1.3. Organ that stores bile

- A. Stomach
- B. Gall bladder
- C. Duodenum
- D. Liver

1.1.4. The process that is illustrated is called...



- A. Peristalsis
- B. Digestion
- C. Assimilation
- D. Absorption

1.1.5. Another name for anaerobic respiration is....

- A. Fermentation
- B. Transpiration
- C. Oxidation
- D. Guttation

1.1.6. Cellular respiration as well as photosynthesis in green leaves take place simultaneously....

- A. 24 hours a day
- B. During the night only
- C. During the day only
- D. Only when the sun is shining brightly

1.1.7. Functional unit of the kidney

- A. Bowmans capsule
- B. Loop of Henle
- C. Pelvis
- D. Nephron

1.1.8. An increased antidiuretic hormone (ADH) level...

- A. Promotes water excretion
- B. Promotes water retention
- C. Increases urea excretion
- D. Increases urine production

1.1.9. Which of the following is usually associated with organisms that depend on the same resources?

- A. Carrying capacity
- B. Migration
- C. Deaths
- D. Competition

1.1.10. Which of the following is a density dependant factor?

- A. Fire
- B. Drought
- C. Predation
- D. Temperature

10x2=(20)

1.2. Give the correct biological terms for each of the following descriptions. Write only the TERM next to the question number.

1.2.1. Waxy layer to reduce water loss in plants *cuticle*

1.2.2. A molecule that is broken down during cellular respiration to provide energy in a living cell. *glucose*

1.2.3. The general energy carrier in the cells of living organisms.

1.2.4. The process of breaking up of fat into tiny fat droplets.

1.2.5. A double walled cup that is next to the glomerulus *wall of Bowman's capsule*

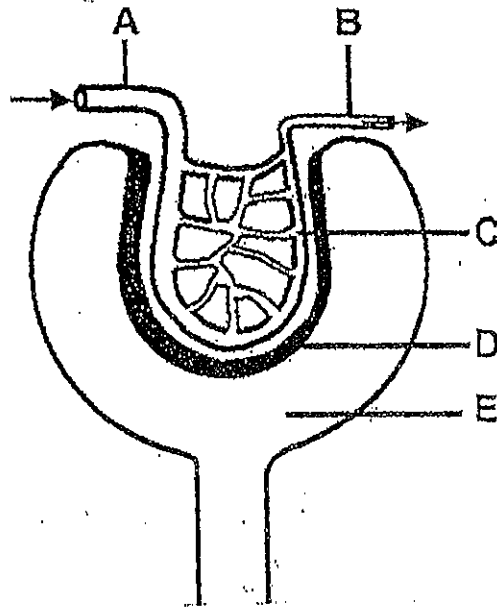
5x1= (5)

1.3. State whether each of the processes in Column A applies to A only, B only, both A and B or none in Column B. Write A only, B only, both A and B or none next to the relevant question number.

<u>COLUMN A</u>	<u>COLUMN B</u>
1.3.1. Blood leaving the kidney contains more of this substance than the blood entering the kidney	<u>A.</u> Amino acids B. Carbon dioxide
1.3.2. Duct carrying urine from kidney to bladder	<u>A.</u> Ureter B. Urethra
1.3.3. Blood contains a higher level of carbon dioxide than oxygen	<u>A.</u> Pulmonary artery B. Renal vein <i>→</i>
1.3.4. Secretion of the hypothalamus	A. Aldosterone B. ADH <i>both</i>
1.3.5. Regulates the composition of blood	<u>A.</u> Kidneys B. Hypothalamus

[5x2=10]

1.4. The diagram below shows the structure of a Malpighian body. Study the diagram and answer the questions that follow.



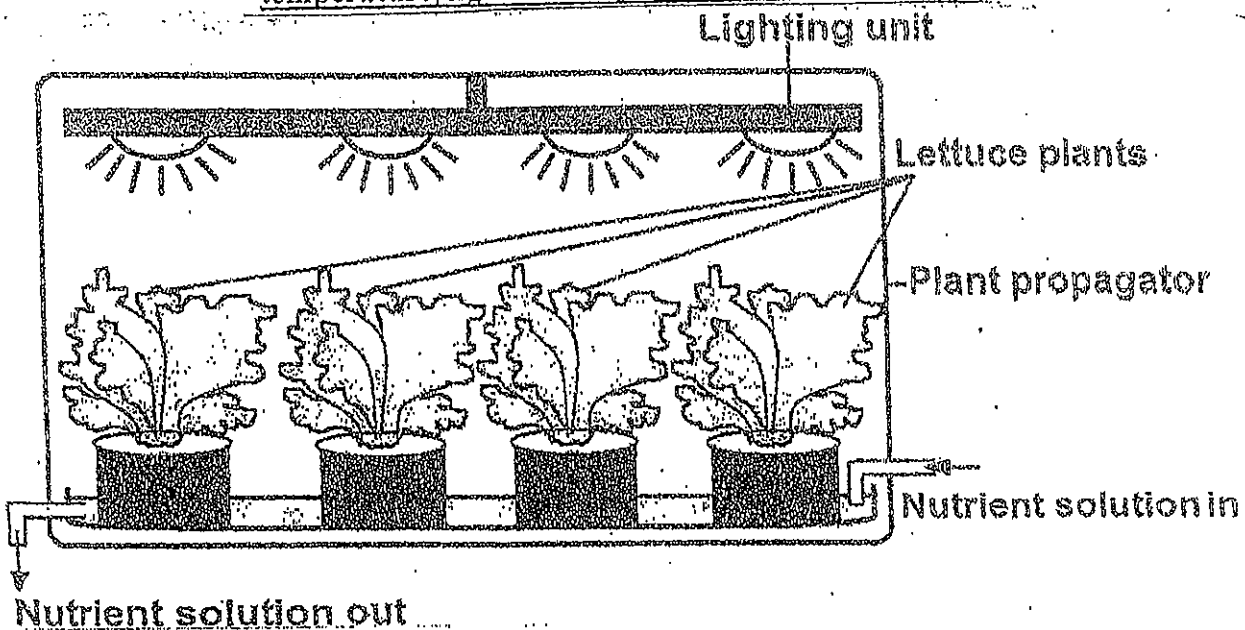
- 1.4.1. Name parts labelled A,B,C,D and E (5)
 1.4.2. Name and explain the process that occurs in the Malpighian body. (5)
 1.4.3. Name the specialised cells found at D. (2)
 1.4.4. Describe the significance of the shape of structure labelled E. (3)

[15]

Total marks for section A = 50 marks.

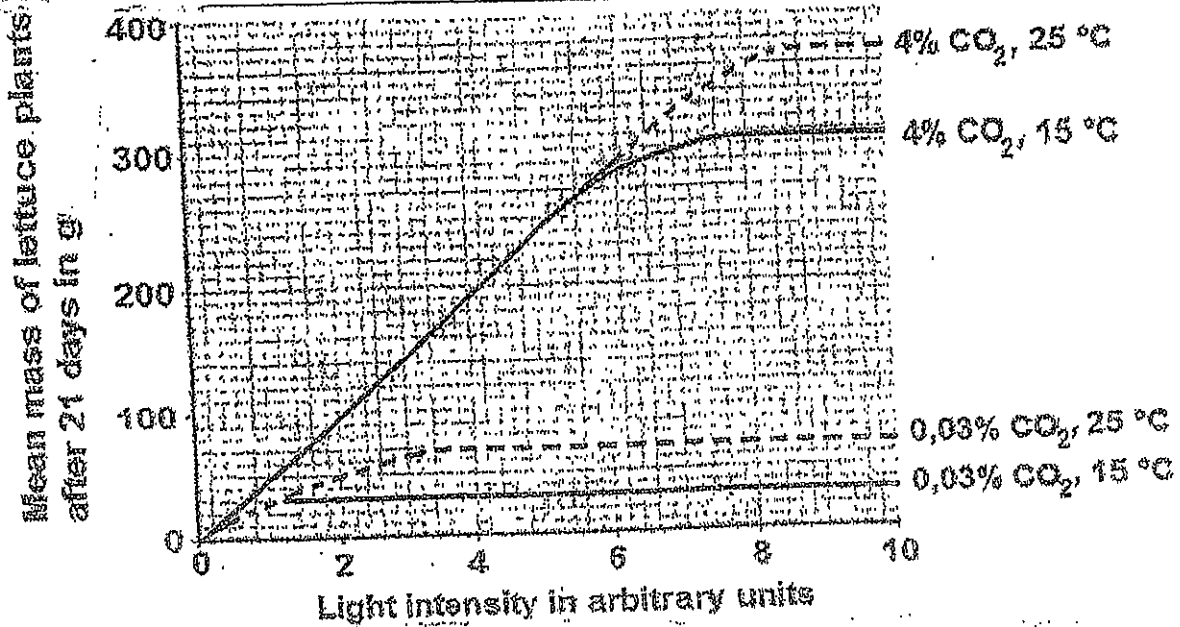
SECTION B
QUESTION 2

2.1 The diagram shows a plant propagator in which scientists can control temperature, light intensity and carbon dioxide concentration:



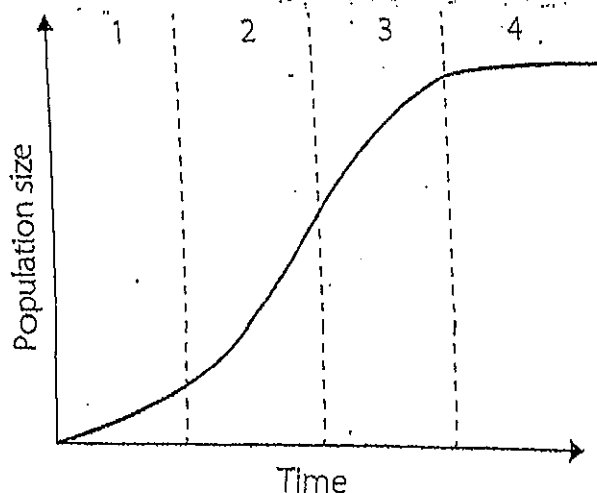
- The scientists set different temperature, CO₂- concentration and light intensity for four lettuce plants.
- The graphical illustration of the results is given below.
- Mean mass of lettuce plants serves as an indication of the rate of photosynthesis.

Study the results given below and answer the following questions:



- 2.1.1 What is the influence of light intensity on mean mass of lettuce plants? (2)
- 2.1.2 Name the **TWO** limiting factors that influence the photosynthesis as the light intensity increases. (2)
- 2.1.3 How was the scientists able to increase the rate of photosynthesis to the maximum level? (3)
- 2.1.4 What would happen to the rate of photosynthesis if the temperature is raised beyond 35°C ? Give a reason for your answer. (3)
- 2.1.5 Draw a labelled diagram of the cell organelle in which photosynthesis occurs ? (5)
- 2.1.6 Discuss the biological importance of photosynthesis. (4)
- 2.1.7 Why is too much light exposure detrimental to photosynthesis? (2)
- (21)

2.2 Study the graph below and answer the questions that follow



- 1
- 2
- 3
- 4

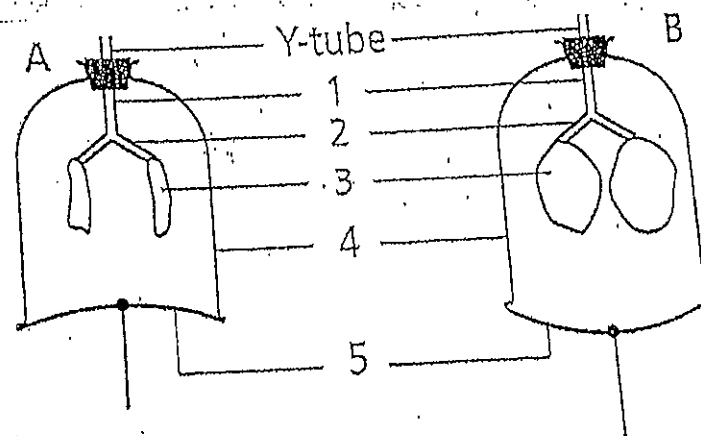
- 2.2.1 Identify the growth form shown in the graph. (1)
- 2.2.2 Name the phases marked 1 to 4. (4)
- 2.2.3 Explain why the initial phase starts slowly. (4)
- 2.2.4 During which phase:
- (a) is the population growing the fastest?
 - (b) does natality far exceed mortality?
 - (c) does environmental resistance come into effect?
 - (d) does natality equal mortality? (4)
- 2.2.5 List and discuss how ANY two density dependant factors could have contributed to population growth slowing down, during stage 3 of the graph (6)

[19]

Total marks for question 2 = (40)

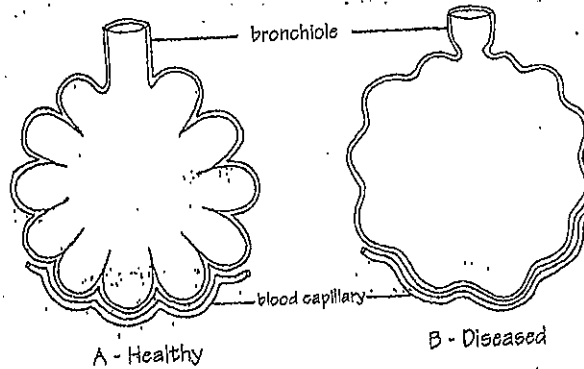
QUESTION 3

3.1 Study the diagram of the apparatus used to demonstrate the mechanism of breathing and then answer the questions



- 3.1.1 Name the parts numbered 4 and 5. (2)
- 3.1.2 Which human structures are represented by the parts numbered 1 to 5 (5)
- 3.1.3 Which apparatus (A or B) represents exhalation?
Give a reason for your answer. (3)
- 3.1.4 Give ONE shortcoming of the apparatus in demonstrating the mechanism of breathing. (2)
- 3.1.5 Describe the mechanism of breathing in humans that Diagram B illustrates (4)

3.1.6 The diagrams below show small part of the lungs from a healthy person (A) and a diseased person (B) suffering from the effects of air pollution. Both are drawn to the same scale.



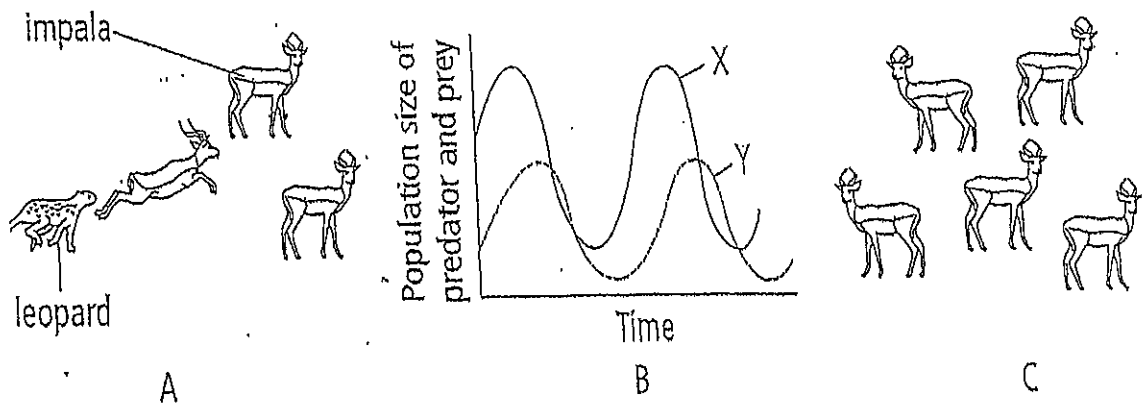
3.1.6.1 Name these structures illustrated above. (1)

3.1.6.2 Name ONE visible difference between the structures A and B. (2)

3.1.6.3 Briefly describe why the features in the lungs of B would make them function less efficiently than lungs in A. (3)

[22]

3.2 Study the illustrations below and then answer the questions that follow.



3.2.1 What type of interaction is indicated at A? (1)

3.2.2 Describe the interaction mentioned in 3.2.1. (2)

3.2.3 What effect will this interaction have on the size of the impala population? (2)

3.2.4 With reference to graph B, which of X or Y indicates:

(a) The impala population? (1)

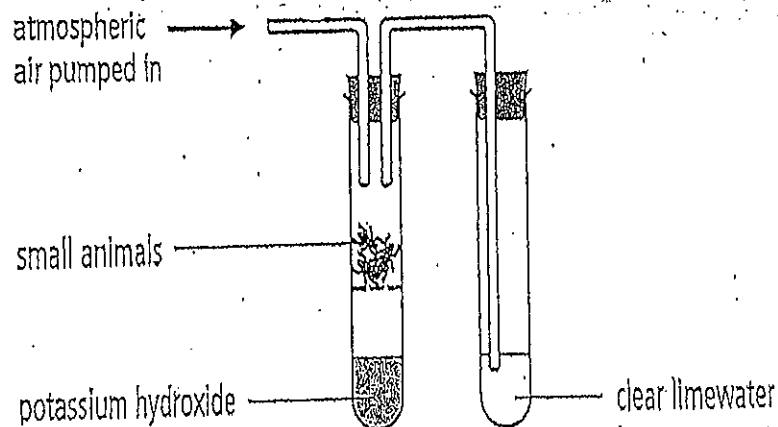
(b) The leopard population? (1)

3.2.5 Explain the pattern of the two growth curves in graph B. Make reference to the leopards and impala in explaining the pattern. (5)

3.2.6 What type of interaction can be expected among the population shown at C, if their food sources suddenly decrease? *Competition* (1)

[13]

3.3 A group of grade 11 learners designed an investigation as illustrated below.
Study the diagram and then answer the questions that follow.



- 3.3.1 Name the biochemical process that the learners intended to investigate. (1)
- 3.3.2 State ONE function of each of the following:
- (a) Potassium hydroxide
 - (b) Clear lime water. (2)
- 3.3.3 Explain One way in which the experimental design should be improved to ensure that the results are valid (2)

[5]

Total for question 3 – (40)

TOTAL FOR SECTION B = (80)

SECTION C
QUESTION 4

The normal blood glucose level in the human body is maintained at approximately 0,7g per cm^3 .

Describe the relationship between the pancreas and liver in maintaining a constant glucose level of the blood. Also discuss the implications if the pancreas doesn't produce enough of Insulin, and the symptoms of the resultant disease.

Content: (17)

Synthesis (3)

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

TOTAL MARK FOR SECTION C = (20)

GRAND TOTAL: (150)