

**KASSU 2023
BIOLOGY PAPER 3
MARKING SCHEME**

1.

Test tubes portion A and B	Test with iodine after adding enzyme		Test with Benedict's solution after 20 mins	
	Observation	Conclusion	Observation	Conclusion
Dilute Hydrochloric acid +solution Q+ solution Z	Blue black	Starch present- (unsuitable pH)	Blue colour persist	Reducing sugar absent
Dilute sodium hydroxide+ solution Q+ solution Z	Brown	starch absent- (ideal pH. for enzyme)	green/yellow colour	Reducing sugar present
Solution W + solution Q+ solution Z	Blue black	Starch present- (unsuitable Ph0)	Blue colour persist	Reducing sugar absent

b) **Enzyme; ptyalin;**

c) **Optimum temperature**

2. The photograph **P** is a pumpkin fruits with seeds .The seeds were germinated under different conditions as shown in photograph **Q1** and**Q2**

a. Study the photograph **Q1**and **Q2** carefully;

i. Identify the conditions under which seedling in photograph **Q1**and **Q2** were grown (2marks)

Q1:

Well lited/light

Q2: dark/absence of light

ii. Give a reason for your response of set up in photograph **Q2?** (1mark)

The seedling are etiolated

iii. State the differences between seedling in photograph **Q1**and**Q2?** (2marks)

photograph Q1	photograph Q2
Green/bigger leaves	Yellow/smaller leaves
Thicker stems	Thinner stems
Strong/steady/firm	weak

iv. A farmer transplanted one of the seedling as shown in photograph **Q1** and it transformed specimen into photograph **R**.The specimen in photograph **R** has developed a certain response to aid in its support:

a) Name the response shown in the shoot of specimen in photograph **R**

(1mark)

Thigmotropism/haptotropism

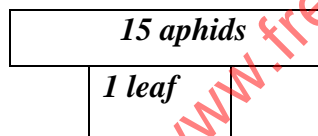
b) Explain how the response occurs? (3marks)

When the tendrils come into contact with the hard object,auxins move away from the side of contact ;the outer side elongates faster than the part in contact thus the tendril to continue to coil round the hard object;

c) What is the significance of this response (1mark)

Enables weak plant to reach light for photosynthesis to occur:enables weak stem to acquire support

b. An ecologist observed one of the leaves from the plant in in photograph **R** and noted it to have aphids as shown in **photograph S** .Count the number of the aphids and sketch a pyramid of numbers (2marks)

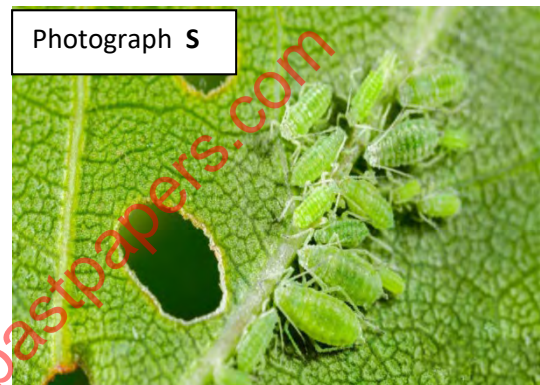
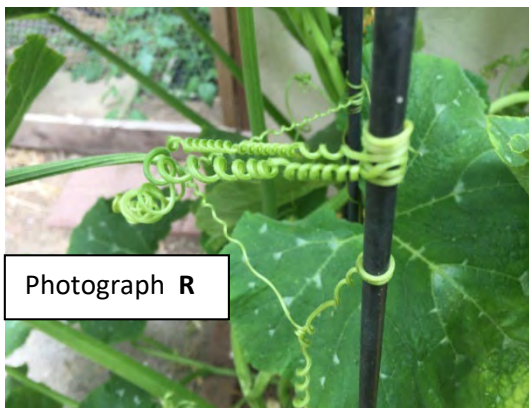
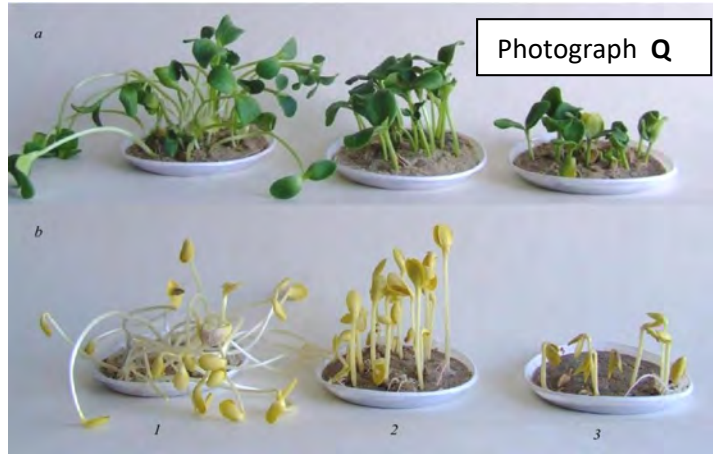
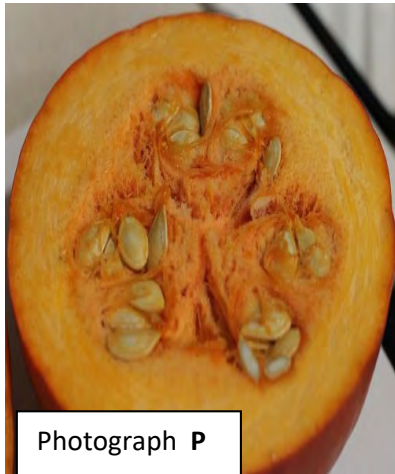


c. Comment on the adaptive advantage that confer the aphids to their habitat (1mark)

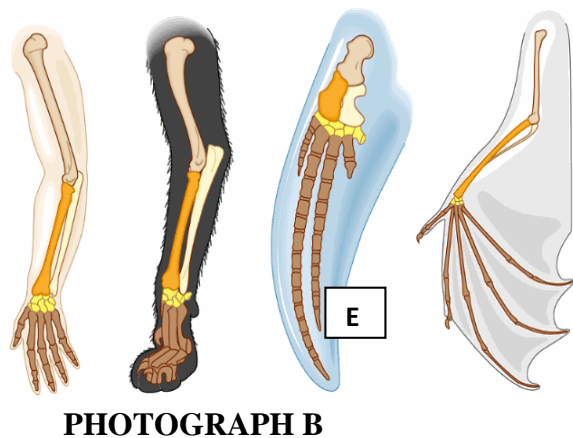
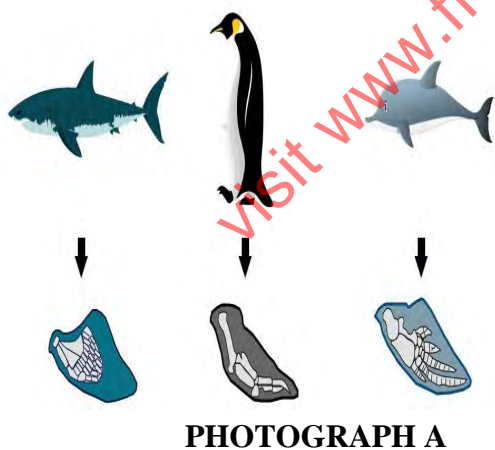
Aphids are green in colour ,blends/carmouflages well with the background therefore not spotted easily by predatory organisms;

d. A farmer has tried using a certain aphicide for a long time but it was not able to eliminate the aphids .Explain the reason for this? (1mark)

Aphids have with time acquired mutant genes against the aphicide thus developing resistance



3. The photographs below represent structures of certain animal species. Study them and answer the questions that follow.



a) Identify the type of structures represented by photographs A and B (2marks)

A *Analogous structures*

B *homologous structures*

- b) What is the specific function of the three structures shown in the photograph A? (1 mark)

Swimming/locomotion in water

- c) Differentiate between the structures you've name 3(a) above (4marks)

Homologous Structures are structures of **similar embryonic origin** but are modified to perform **different functions** in different ecological niches, while **Analogous structures** are structures of different embryonic origin that become modified in the course of evolution (evolved) to perform similar functions in the same ecological niches (due to exploitation of common ecological environment or niche.)

- d) Name the type of evolution exhibited by photographs A and B. (2marks)

A: *Convergent evolution*

B: *Divergent evolution*

- e) Using Darwin's theory of evolution, explain how the whale's flipper E would have evolved. (3 marks)

Small variations occurred in Locomotory structures within the population brought about by the prevailing environments Hindlimbs began to regress as the ancestors of whales entered the aquatic environment: Over time whale descendants spent more and more time in the water and their bodies became adapted for swimming. Their front legs became flippers.