

NAME..... CLASS.....

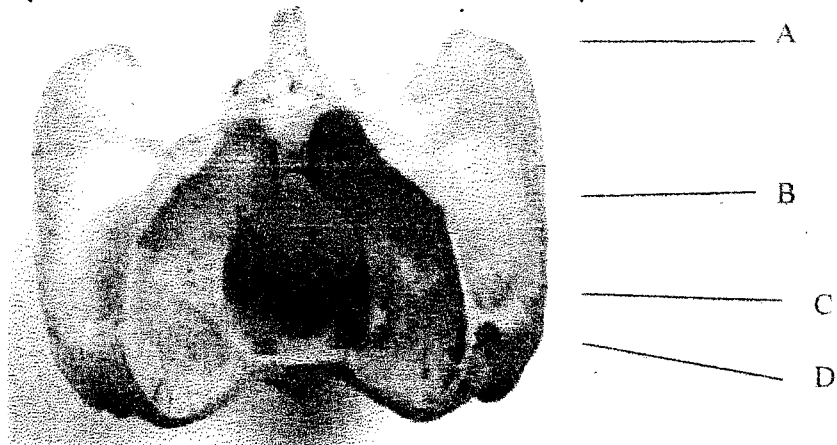
ADM NO.....

ALLIANCE HIGH SCHOOL

FORM 4 : BIOLOGY PAPER : 2HOURS

TERM 1, 2016

1. Below is a photograph of a mammalian vertebra. Study it and answer the questions below



(i) Identify the view from which the photograph was taken (1mk)

(ii) Name the vertebra above _____ (1mk)

(iii) On the photograph name parts labeled A to D (4mks)

State how the above structure is adapted to perform its function (3mks)

2. Study photograph P below and use it to answer the following questions.



PHOTOGRAPH P

(a) On the photograph label a bract (1mk)

(b) Describe the arrangement of stamens and structure of corolla and calyx

(i) Stamens (1mk)

(ii) Corolla (1mk)

(iii) Calyx (1mk)

(c) (i) Name the class of the plant from which the photograph was taken (1mk)

(ii) Using only observable features on the photograph give one reason for your answer in (c)

(i) above (1mk)

(d) (i) state the agent of pollination for the flower shown on the photograph (1mk)

(ii) Give two reasons for your answer in d (i) above

(2mks)

(e) (i) Which type of ovary is found in the flower on the photograph

(1mk)

(ii) Give a reason for your answer in e (i) above

(1mk)

(f) The actual length of the flower measured 14cm. Work out the magnification of the Photograph

(2mks)

3. Explain why the removal of a placenta from the walls of the uterus before birth would result in the death of the foetus.

(2mks)

4. Explain why decomposers are never included in a food chain

(1mk)

5. Name the fins that prevent yawing and pitching movements

(2mk)

6(a) Explain why athletes train in high altitude in preparation for competition

(2mks)

(b) Name the characteristic that makes the red blood cells to pass through the capillaries

(1mk)

(c) In what form is Carbon (IV) Oxide transported in the erythrocytes

(1mk)

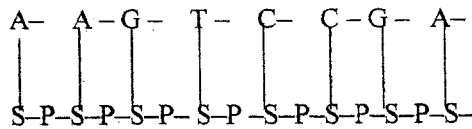
7. State three applications of genetics

(3mks)

8. State the adaptations of herbivores which enable them to digest cellulose..

(2mks)

9. Below is a nucleotide strand



(a) i) Identify the strand above . Give a reason

(2mks)

(ii) State complimentary nucleotide strand

(1mk)

(b) State an example of a sex linked trait in Y chromosome and X chromosome in human

(2mk)

c) State a genetic disorder caused by processing extra sex chromosome

(1mk)

10. A woman whose blood group is O gives birth to a son whose blood group is A and a daughter whose blood group is B

(a) (i) State the possible genotype of the father. (1mk)

(ii) Using a punnet square work out the genotypes of the offsprings (3mk)

(b) If the mother is rhesus negative and the father is rhesus positive what condition is the child likely to develop (1mk)

(c) Explain why the second born child is at risk of death than the first born child if no Precaution is taken (2mks)

11. Define the term species (2mks)

12. A student was provided with solutions labeled P₁, P₂, P₃. Benedict's solution and iodine solution. Solution P₃ is similar to P₂ except that it has been boiled. P₁ contained starch only.

(a) Iodine and Benedict's solutions were used to test food substances contained in solution P₁. Record the expected results in the table below. (4mks)

Food substance	Procedure	Observation	Conclusion

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(b) Three test tube were Labeled X_1 , X_2 and X_3 . Treated each test tube as follows.

Test tube	Treatment
X_1	Put 1ml of solution P ₁
X_2	Put 1ml of solution P ₁ and add 1 ml of solution P ₂
X_3	Put 1ml of solution P ₁ and 1ml solution P ₃

The three test tubes were placed in a warm water bath whose temperature is maintained between 30°C and 37°C. The set ups was left for 30 minutes

(b) The food substance contained in each test tube was tested by using Benedict's solution.

The results shown that only x_2 had reducing sugar. Fill in the table below. (3mks)

Test tube	Observation	Conclusion
X_1		
X_2		
X_3		

(c) Account for the results at the end of the experiment in test tube labeled X_2 and X_3

(i) X_2 (2mks)

(ii) X_3 (1mk)

(d)(i) Suggest the identity of solution P₂ (1mk)

(ii) Give one reason for your answer in d (i) above (1mk)

13. A study was carried out to investigate the distribution of certain mammals in a game reserve with three different habitats. The results are shown in the table below

HABITAT	NUMBER IN HABITAT			
	WILDEBEEST	BUFFALO	RHINOCERAS	LESSER KUDU
GRASSLAND	-	63	13	-
WOODED GRASSLAND	56	87	50	25
FOREST	10	-	50	75

From the above table suggest:

a) i) a suitable method that could have been used to obtain the data from the three habitats. (1mk)

(ii) State two reasons why all the mammalian species were found in the wooded grassland.

(2mk)

b) From the data, deduce the feeding habits of (2mk)

(i) Wildbeest

(ii) Lesser kudu

c) The vegetation in this game reserve was destroyed by fire. Two weeks after the onset of rains, most of the animals were found in the grassland. Explain. (2mks)

14. In an experiment, wondering Jew plants with green leaves were kept in the dark for one hour. Strips of leaves measuring 5 mm by 10 mm from these plants were then cut and floated with the lower epidermis down on the experimental solutions in Petri-dishes. The experimental solutions were sodium chloride and potassium chloride with equal concentration of 1.50M. The Petri dishes were then placed in light and temperature kept at 20°C. After 5 minutes, a leaf strip was removed from each experimental solution, quickly blotted dry and the percentage number of open stomata was found after counting under a microscope. This procedure was repeated with other strips from the same experimental solutions at intervals of 10 minutes. The results are shown in the table below.

Time in minutes	5	15	25	35	45	55	60	65	70
% open stomata in KCl Sol. (1.50 M)	0	0	20	76	82	86	90	93	98
% Open stomata in NaCl Sol. (1.50 M)	0	0	6	22	42	45	50	54	58

a) On same axes, plot graph for percentage open stomata in each solutions against time in minutes (7mks)

b) Why was it necessary to keep the plants in the dark for a period of time before the experiments. (1mk)

c) Using the graph in (a) above, give an explanation for the behavior of guard cells during this experiment. (4mks)

d) What would happen if the experiment had been carried out in the dark. (1mk)

e) Explain how the stomata opens using the photosynthetic theory only.

(5mks)

15. Explain how the exoskeleton in arthropods is adapted to its functions

(13mks)
