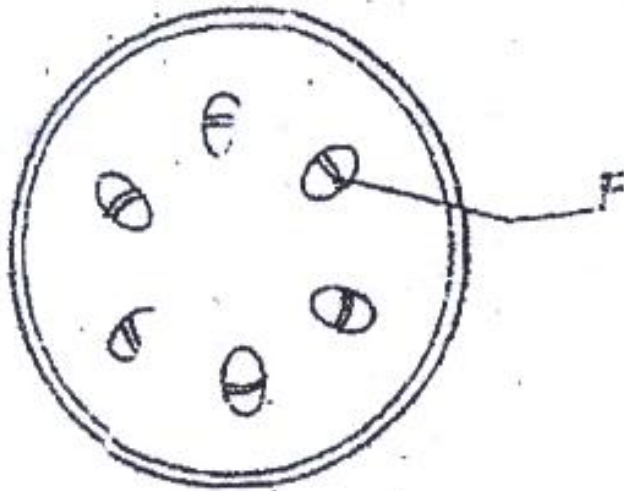


(i) Hybrid vigour ( 1 mk)

(ii) Polyploidy? ( 1 mk)

(b) State two causes of chromosomal mutations ( 2 mks)

6. The diagram below shows a section through a plant organ



(a) (i) Name the class of the plant which the section was obtained ( 1 mk)

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

(b) State the functions of the part labeled F ( 1 mk)

7. State the function of the following cell organelles

(a) Ribosome ( 1 mk)

(b) Lysosomes ( 1 mk)

8. (a) Pregnancies continues if the ovary of an expectant mother is removed

after 4 months explain

( 2 mks)

(b) What is the role of the testes in the mammalian reproductive systems?

( 2 mks)

9. (a) Name the causative agents of the following diseases in humans ( 2 mks)

(i) Typhoid

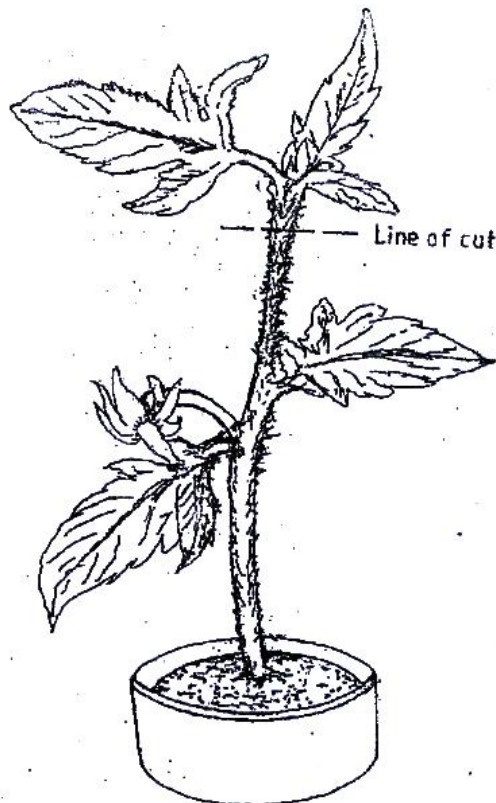
(ii) Amoebic dysentery

(b) Name the disease in humans caused by plasmodium falciparum ( 1 mk)

10. (a) (i) What is meant by vestigial structures ? ( 1 mk)

(ii) Give an example of a vestigial structure in human ( 1 mk)

(b) Explain why certain drugs become ineffective in curing a disease after many years of use.



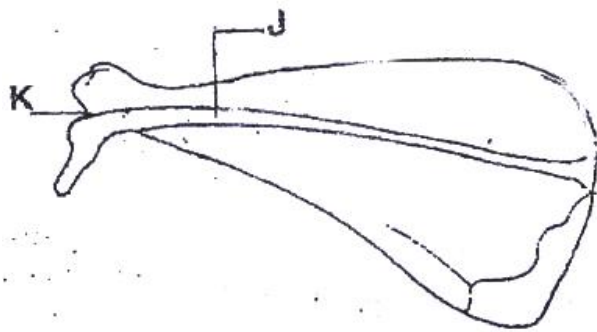
( 2 mks)

11. In an experiment the shoot tip of a young tomato plant was decapitated as shown in the diagram below

(a) State the expected results after 2 weeks ( 1 mk)

(b) Give a reason for your answer in (a) above ( 2 mks)

12. The diagram below represents a bone obtained from a mammal



(a) Name the bone ( 1 mk)

(b) Name the:

(i) Bone which articulate with the bone named in (a) above at the cavity labeled K; ( 1 mk)

(ii) Joint formed by the two bones ( 1 mk)

(c) State the function of the part labeled J ( 1 mk)

13. (a) Distinguish between diffusion and active transport ( 2 mks)

(b) State one role that is played by osmosis in ( 1 mk)

(i) Plants

(ii) Animals

14. Name a support tissue in plants that is not thickened with lignin ( 1 mk)

15. Name the type of movement that occurs within a plant cell ( 1 mk)

16. (a) Name the gaseous exchange surface in insects ( 1 mk)

(b) How is the surface named in (a) above suited to its function ( 2 mks)

17. Explain why plants do not require specialized excretory organs ( 4 mks)

18. Explain how the following factors affect the rate of photosynthesis:

(a) Concentration of carbon (iv) oxide ( 1 mk)

(b) Light intensity ( 1mk)

19. (a) State three effects of dumping untreated sewage into a river (3 mks)

(b) Name one process that is responsible for loss of energy from one trophic level to the next (1mk)

20. Other than using the quadratic, give two methods of estimating population of grass (2 mks)

21. Explain what happens in humans when concentration of glucose in the blood decreases below the normal level (4 mks)

22. Explain how the carnassials teeth of a dog are adapted to their function (2 mks)

23. state the function of iron in the human body (1 mk)

24. Explain how the following factors determine the daily energy requirement in human:

(a) Age (1 mk)

(b) Occupation (1 mk)

(c) Sex (1 mk)

25. State two ways in which aerenchyma tissues in aquatic plants are adapted to their function. ( 2 mks)

26. How are the mitochondria adapted to their functions? ( 2 mks)

27. State two ways in which anaerobic respiration is applied in industries ( 2 mks)

28. (a) State three structural differences between arteries and veins in mammals

( 3 mks)

(b) Name a disease that causes thickening and hardening of arteries

( 1 mk)

29. Explain why the rate of transpiration is reduced when humidity is high

## BIOLOGY PAPER 2

### SECTION A (40 MARKS)

**Answer all the questions in this section in the spaces provided**

1. When the offspring of purple and white flowered pea plants were crossed, they produced purple and white flowered plants in the ratio of 3: 1

Using letter H to represent the gene for purple colour

(a) State the genotype of:

(i) Parents ( 2 mks)

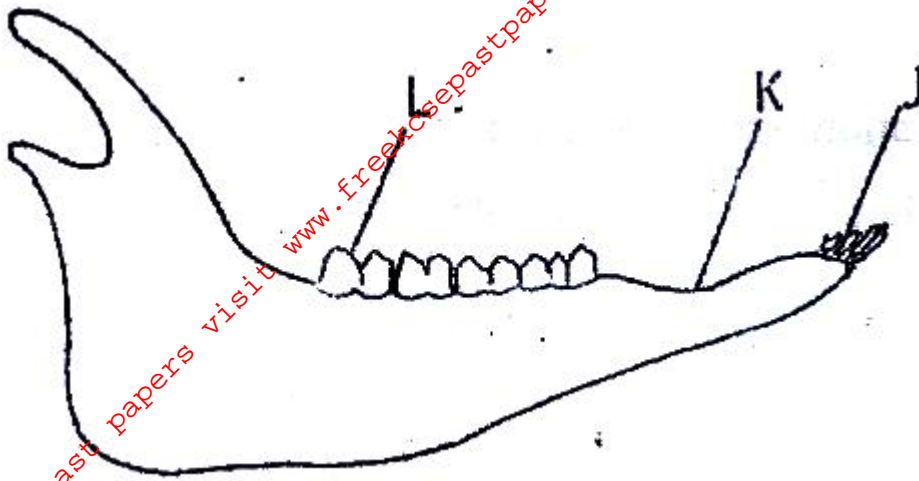
(ii) F<sub>1</sub> Generation ( 1 mk)

(b) Work out the cross between plants in the F<sub>1</sub> generation( 4 mks)

(c) Account for the colour the flowers in plants of the F<sub>1</sub> generation

( 1 mk)

2. The diagram below represents the lower jaw of a mammal



(a) Name the mode of nutrition of the mammal whose jaw is shown (1 mk)

(b) State one structural and one functional difference between the teeth labeled J and L

Structural (1 mk)

Functional (1 mk)

(c) (i) name the toothless gap labeled K. (1 mk)

(d) Name the substance that is responsible for hardening of teeth (1 mk)

3. (a) what is meant by the term biological control (1 mk)

(i) Give an example of biological control (1 mk)

(b) (i) What is eutrophication? (3 mks)



(ii) What are the effects of eutrophication ( 3 mks)

(c) Name a substance that is responsible for acid rain ( 1 mk)

4. (a) (i) Explain the changes that take place in the pupil and iris of a human eye when a person moves from a dark room to a room with bright light ( 3 mks)

(ii) What is the significance of the changes explained in (a) above (1 mk)

(b) How does the human eye obtain nutrients? ( 3 mks)

(c) Explain why images that form on the blind spot are not perceived ( 2 mks)

5. (a) what happens when a wilting young plants is well watered ( 3 mks)

(b) Name a support tissue in plants thickened with

(i) Cellulose ( 1 mk)

(ii) Lignin ( 1 mk)

(c) Give three functions of pectoral and pelvic fins in a fish (3 mks)

## **SECTION B (40 MARKS)**

***Answer questions 6 (compulsory) and either question 7 or 8 in the spaces provided after questions 8***

6. An experiment was carried out to investigate the effect of temperature on the rate of reaction catalyzed by an enzyme. The results are shown in the table below

Temperature ( $^{\circ}\text{C}$ )	Rate of reaction in mg of products per unit time
5	0.2
10	0.5
15	0.8
20	1.1
25	1.5
30	2.1
35	3.0
40	3.7
45	3.4
50	2.8
55	2.1
60	1.1

On the grid provided draw a graph of rate of reaction against temperature

( 6 mks)

(b) When was the rate of reaction 2.6 mg of product per unit time? ( 2 mks)

(c) Account for the shape of the graph between

(i) 5<sup>o</sup> C and 40<sup>o</sup> C

( 2 mks)

(ii) 45<sup>o</sup> C and 60<sup>o</sup>C

( 3 mks)

(d) Other than temperature name two ways in which the rate of reaction between 5<sup>o</sup>C and 40<sup>o</sup>C could be increased

( 2 mks)

(e) (i) Name one digestive enzymes in the human body which works best in acidic condition

( 1 mk)

(ii) How is the acidic condition for the enzyme named in (e) (i) above attained?

( 2 mks)

(f) The acidic conditions in (e) (ii) above is later neutralized

(i) Where does the neutralization take place?

(ii) Name the substance responsible for neutralization

( 1 mk)

7. How are flowers adapted to wind and insect pollination?

( 20 mks)

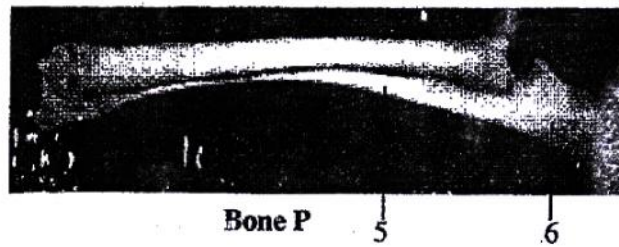
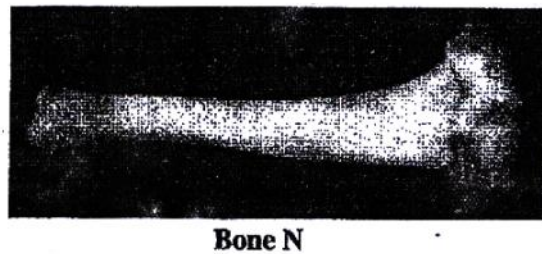
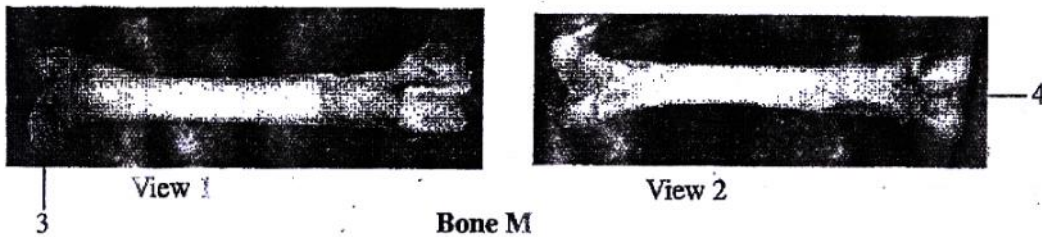
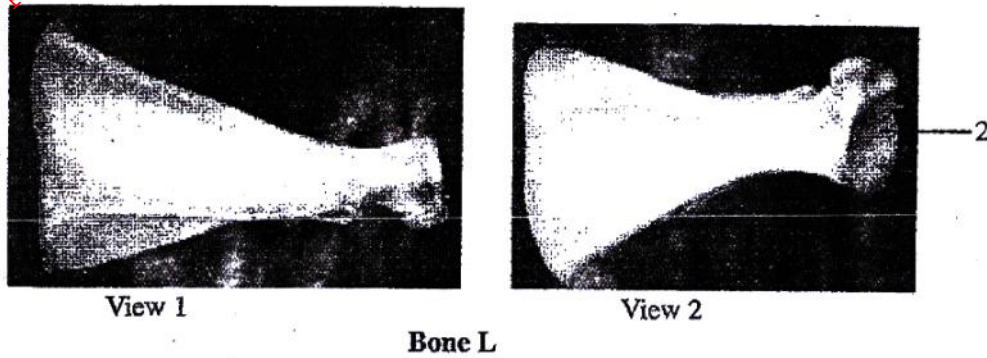
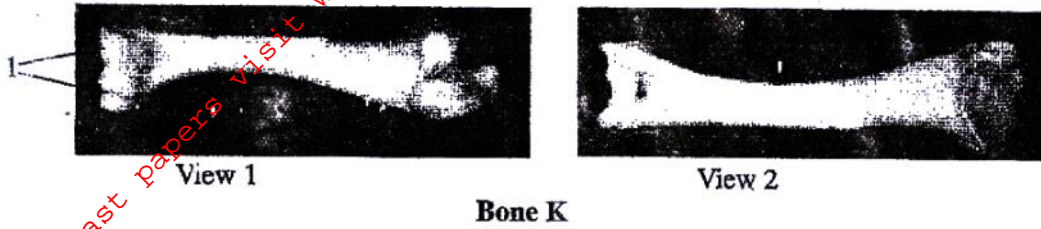
8. Describe the role of the liver in homeostasis in the human body

( 20 mks)

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### BIOLOGY PAPER 3

The photographs labeled K L, M and P below are of bones obtained from a mammal for each of the bones K, L and M two views are shown



Identify the bones and name the part of the mammalian body from which each was obtained

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Body	Identity of the bone	where found
K	.....	.....
L	.....	.....
M	.....	.....
N	.....	.....
P	.....	.....

Name the parts labeled 1,2,3,4 and 5 ( 5 mks)

- 1. ....
- 2. ....
- 3. ....
- 4. ....
- 5. ....

Name the bones that form a joint with bone K at its anterior and posterior and in each case name the type of joint they form ( 4 mks)

- (i) Bone(s) .....
- (ii) Type of joint .....

Posterior end

- (i) Bone (s) .....

(ii) Type of joint .....

State the function of the structure labeled 6 in bone P ( 1 mks)

2. You are provided with substances labeled P,Q,X,Y and Z. P and Q are food substances, while X is dilute hydrochloric acid, Y is dilute sodium hydrogen carbonate and Z is Benedict's solution. Carry out tests to determine the food substance (s) in P and Q. ( 12 mks)

Substance	Food substances being tested for	Procedure	Observations	Conclusions
P				
Q				

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3. The photographs labeled W, X, Y and Z show seedlings that were grown under different conditions. Examine them



W



X

Using



observable features only state three differences between the seedling in photographs W and X ( 3 mks)

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.....

Seedlings in photographs Y and Z were planted at the same time but under different conditions. Explain how the response exhibited by the seedlings in photographs Z occurred. ( 2 mks)

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