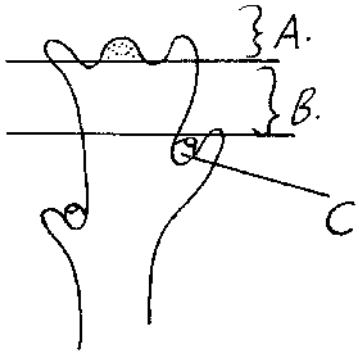
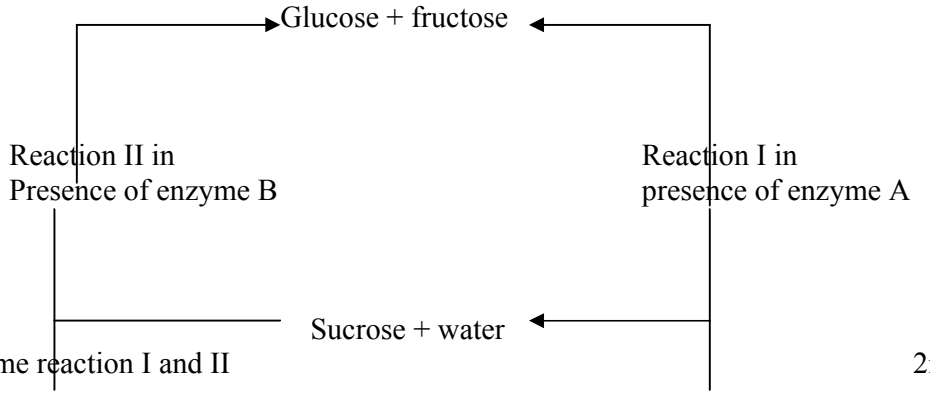
BIOLOGY
THEORY
Paper 1

1. In which two ways are the organelles chloroplast and mitochondria similar. 2mks*Tso*
2. How does the process of respiration depend on photosynthesis? 2mks*Tso*
3. State the importance of each of the following features in animals. 3mks*Tso*
   a) Solid food being broken into small pieces.
   b) Presence of caecum in herbivores mammals.
   c) Long ileum in man.
4. The paddles of whales and fins of fish adapt these organisms to their aquatic habitats.
   (i) Name the evolutionary process that may have given rise to the similar structures1mk*Tso*
   (ii) What name is given to such structure?
5. a) Give a reason why most monocotyledonous plants like maize lack secondary growth. 1mk*Tso*
   b) The diagram below shows a section of the stem apex.



   Identify the parts labeled A,B and C. 2mks*Tso*
6. a) Name the site of production of testosterone hormone in a mammalian male body.1mk*Tso*
   b) Explain why pregnancy in humans can be terminated when the ovary is removed before the end of four months but will not be terminated when removed after four months.3mks*Tso*
7. List THREE sources of errors when using capture recapture method of estimating the population of animal in a forest ecosystem.. 3mks*Tso*
8. Explain the importance of keeping bees in an orchard. 2mks*Tso*
9. Explain how each of the following causes variation.
   (i) Meiosis 1mk*Tso*
   (ii) Fertilisation 1mk*Tso*
10. Other than having many features in common, state the other TWO characteristics of a species. 2mks*Tso*
11. State THREE roles of osmosis in plants. 2mks*Tso*
12. The diagram below shows chemical reactions I and II which are controlled by enzymes A and B respectively.



   a) Name reaction I and II 2mks*Tso*

Reaction I
Reaction II

b) Give an example of

i) Structural proteins 1mk*Tso*

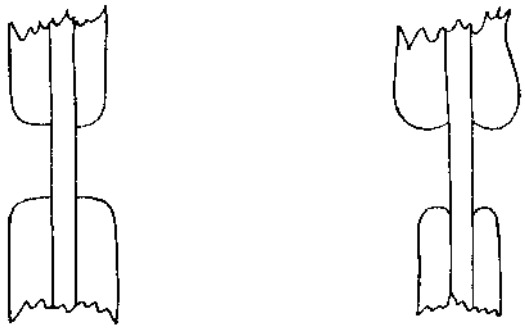
(ii) Functional protein 1mk*Tso*

13. Two populations of the same species of birds were separated over a long period of time by an ocean. Both populations initially feed on insects only. Later it was observed that one population fed entirely on fruits and seeds, although insects were available.
Name

a) The type of isolation 1mk*Tso*

b) The type of evolutionary change. 1mk*Tso*

14. The diagrams below show an experiment that was carried out by a student.



At the beginning At the end

(i) What is the aim of the experiment 1mk*Tso*

(ii) Account for the observation at the end of the experiment 2mks*Tso*

15. The oxidation of a certain fat is represented by the chemical equation shown below.

$$C_{57}H_{104}O_6 + 80\ O_2 \longrightarrow 57co_2 + 52H_2O + \text{Energy}$$

Calculate the respiratory quotient (RQ) of the fat. 2mks*Tso*

16. State TWO functions of haustoria's in parasitic fungi. 2mks*Tso*

17. a) Name one waste product that is almost absent in the renal vein but is normally present in the renal artery 1mk*Tso*

b) Transported in the blood and is not removed by the kidneys. 1mk*Tso*

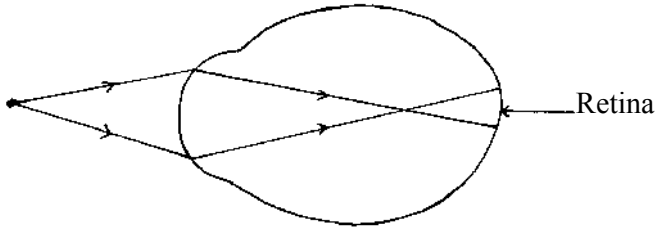
18. A leaf of a potted green plant which had been kept in the dark for 24 hours was smeared with petroleum jelly on its lower surface and exposed to sunlight for 6 hours. Starch test on the leaf was negative. Account for the observation 2mks*Tso*

19. Name two features of alveoli that adapt them to their function. 2mks*Tso*

20. a) What type of response does Euglena show when there is an area of brighter light nearby? 1mk*Tso*

b) State the significance of the above response. 1mk*Tso*

21. Study the diagram below showing a mammalian eye defect

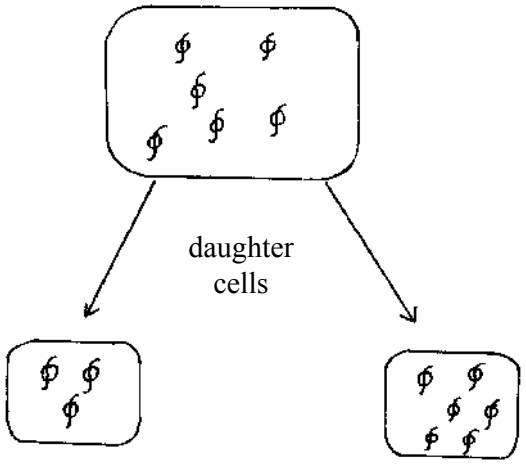


a) identify the eye defect 1mk*Tso*

b) How can the above defect be corrected. 1mk*Tso*

22. Explain why primary productivity in aquatic ecosystem decreases with increase in length. 4mks*Tso*

23. The figure below shows the nucleus of a diploid cell during early prophase and the daughter cells formed after a cell division.



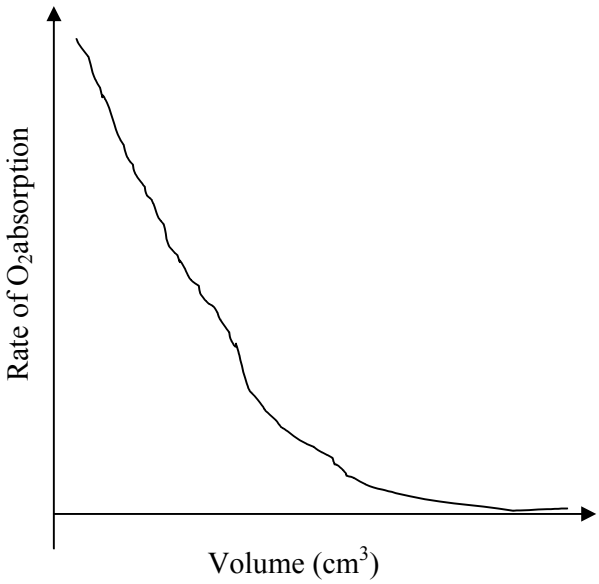
Which type of cell division will result in the formation of the daughter cells represented by letters X and Y 2mks*Tso*

24. The concentration of urea and urine excreted by a person varies daily . State any factors that will determine the concentration of:-

(i) Urea produced 1mk*Tso*

(ii) Urine produced 1mk*Tso*

25. The graph below shows the rate of O_2 absorption by a hydra as it grows.

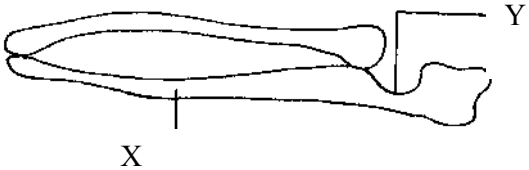


a) What is the relationship between volume of Hydra and the rate of oxygen absorption.

1mk*Tso*

b) Give a reason for your answer in a(i) above. 2mks*Tso*

26. The figure below represents a mammalian bone.



a) Identify the bone labeled X 1mk

b) Which bone articulates with this bone at part Y? 1mk*Tso*

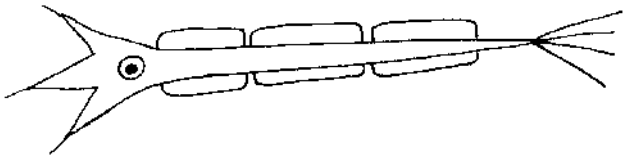
c) Name the type of joint formed with the above bone at point Y. 1mk*Tso*

27. Red fox has 34 chromosomes in their body cells. The arctic fox has 52 chromosomes. Occasionally the Red and arctic fox mate to give rise to hybrids.
(i) What would be the chromosomal constitution of the hybrid. 1mk*Tso*
(ii) Explain whether or not their hybrids can bring forth offsprings when they are selfed. 2mks*Tso*

28. Explain how the following skin structures help in thermoregulation on a hot day:-
(i) Blood vessels; 2mks*Tso*
(ii) Erector pili muscles. 2mks*Tso*

29. Name a human disease that mainly attacks the following blood cells. 2mks*Tso*
(i) Red blood cells
(ii) White blood cells

30. The figure below shows a neuron



a) Which type of neuron is represented by the diagram 1mk*Tso*
b) By use of an arrow, show on the diagram the direction to which an impulse will move on the axon.

31. Why is O_2 important in the process of active transport in cells.

32. The data below shows the time taken by cobalt chloride paper to turn pink on upper surface and lower surface when two species of plants labeled X and Y were used.

Species	Upper surface	Lower surface
X	27 sec	42 sec
Y	35 sec	21 sec

a) What is the likely habitat of the plant species labeled X. 1mk*Tso*
b)Account for the time taken by the plant species labeled Y. 3mks*Tso*