BIOLOGY PAPER 231/1 KC.S.E 1998
QUESTIONS

1. Why are people with blood group O universal donors?
2. State one effect of magnesium deficiency in green plants
3. Which organelle would be abundant in:
   Skeletal muscle cell
   Palisade cell
4. Why are gills in fish highly vascularized?
5. What is the relationship between leguminous plants and bacteria found in their root modules?
6. In an experiment it was found that when maggots are exposed to light they move to dark areas.
   (a) Name the type of response exhibited by the maggots
   (b) Name the advantages of the response to the maggots
7. The diagram below represents a mammalian bone

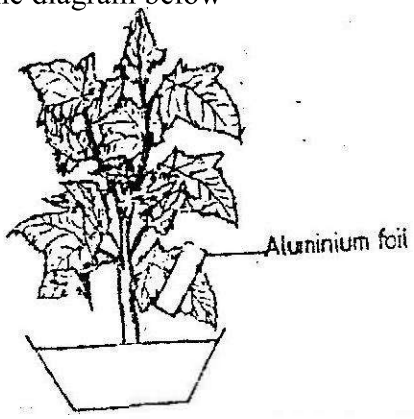
(a) Name the bone
(b) Name the type of the joint formed by the bone at its anterior end with the adjacent bone
8. A flower was found to have the following characteristics:
   Inconspicuous petals
   Long feathery stigma
   Small, light pollen grains
(a) What is the likely agent of pollination of the flower
(b) What is the significance of the long feathery stigma in the flower?
9. What makes young herbaceous plant remain upright?
10. Give two reasons why primary productivity in an aquatic ecosystem decreases with depth.
11. State two ways by which the human immuno deficiency (H.I.V) is transmitted other than through sexual intercourse?
12. In a family with four children, three were found to have normal skin pigmentation while one was an albino.
    Using letter A to represent gene for normal skin pigmentation and a to represent the gene for albinism,

(a) What are the genotypes of the parents?
(b) Work out the genotype of
   (i) Normal pigmentation
   (ii) The albino child
   Genotype of normal pigmented children
(c) What is the probability that the fifth child will be an albino?

13. (a) List four differences between meiosis and mitosis
    (b) Which sex chromosomes are found in human?

Sperm cell?
Ova?

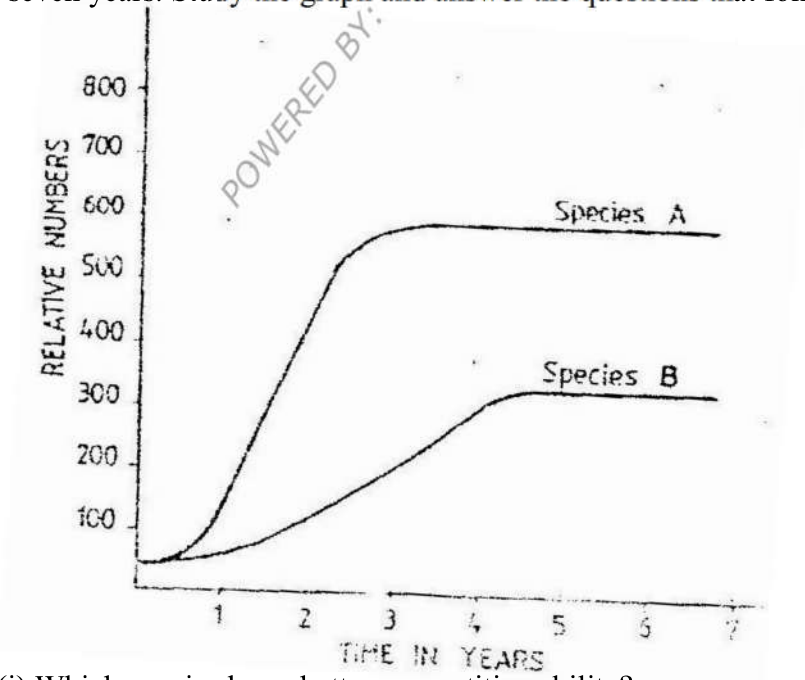
14. In an experiment to investigate a factor affecting photosynthesis, a leaf of a potted plant which had been kept in the dark overnight was covered with aluminum foil as shown in the diagram below



The set up was kept in sunlight for three hours after which a food test was carried out on the leaf.

(a) Which factor was being investigated in the experiment?
(b) What food test was carried out?
(c) (i) State the results of the food test
(ii) Account for the results in c (i) above
(d) Why was it necessary to keep the plant in darkness; before the experiment?

15. The herbivorous mammalian species were introduced into an ecosystem at the same time and in equal numbers. The graph below represents their populations during the first seven years. Study the graph and answer the questions that follow.

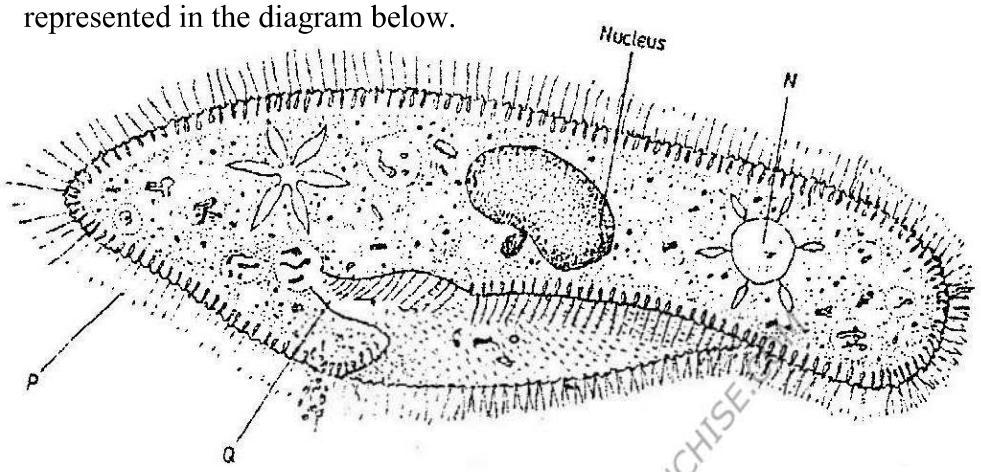


(a) (i) Which species has a better competitive ability?
(ii) Give reason for your answer
(b) Account for the shape of the curve species A between

(i) One year and three years
(ii) Three years and seven years

(c) A natural predator for species A was introduced into the ecosystem. With a reason state how the population of each species would be affected.

16. A student placed a drop of pond water in a cavity slide and observed it under the microscope. The student observed many fast moving organisms, one of which is represented in the diagram below.

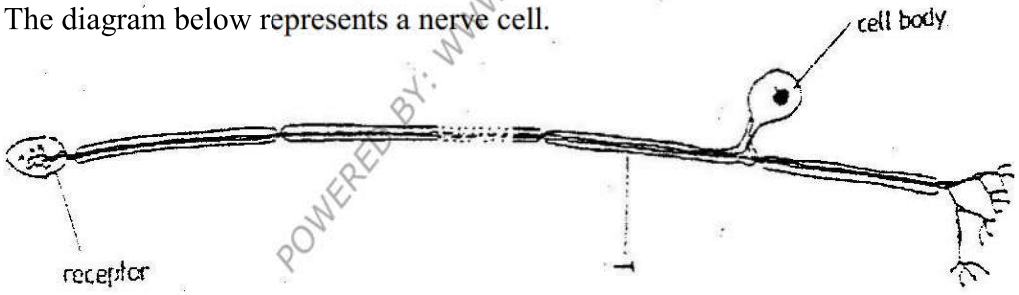


(a) (i) Name the phylum to which the organism belongs
(ii) Give a reason for your answer in (a) (i) above

(b) Name the structures labeled N, P and Q.

(c) State two observable features that enable the organism to move fast.

17. The diagram below represents a nerve cell.



(a) (i) Identify the nerve cell.
(ii) Give a reason your answer in (a) (i) above

(b) Name the structure labeled T

(c) Using an arrow indicate on the diagram the direction of movement of an impulse in the cell.

18. A hungry person had a meal, after which the concentration of glucose and amino acids in the blood were determined. This was measured hourly as the blood passed through the hepatic portal vein and the iliac vein in the leg. The results were as shown in the table below.

	Time (Hrs)	Concentration of contents in hepatic portal vein (mg/100ml)	Concentration of contents in the iliac vein of the leg (mg/100ml)		
		Glucose	Amino acids	Glucose	Amino Acids
	0	85	1.0	85	1.0
	1	85	1.0	85	1.0
	2	140	1.0	125	1.0
	3	130	1.5	110	1.5
	4	110	1.5	90	3.0
	5	90	3.0	90	2.0
	6	90	2.0	90	1.0
	7	90	1.0	90	1.0
			1.0		

(a) Using the same axes draw graphs of concentration of glucose in the heptic portal vein and the iliac vein in the leg against time

(b) Account for the concentration of glucose in the hepatic vein from:
(i) 0/1 hour
(ii) 1-2 hour
(iii) 2- 4 hours
(iv) 5 – 7 hours

(c) Account for the difference in the concentration of glucose in hepatic portal vein and the iliac vein between 2 and 4 hours.

(d) Using the data provided in the table explain why the concentration of amino acids in the hepatic portal vein took longer to increase.

19. Discuss the various evidences, which show that evolution has taken place.

20. Explain how the mammalian intestines are adapted to perform their function.