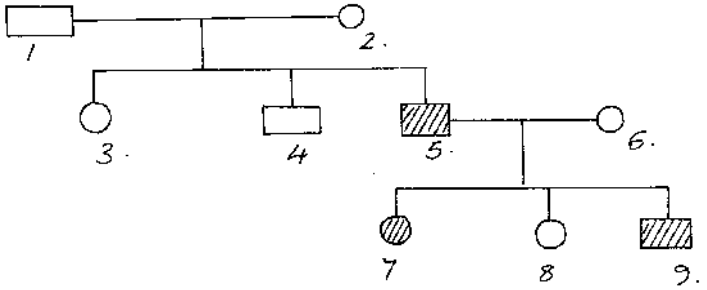
231/2
Paper 2

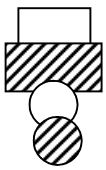
SECTION A (40 MARKS)

Answer <u>all</u> questions in this section in the spaces provided.

1. During ecological study, students collected and marked 120 ants and released them. After 48 hours, the students captured another 90 ants, 20 of which had been marked previously.
   (a) How many ants were there in the compound? Show your working. 3mks*Kyo*
   (b) What are the limitations of this method in sampling animal populations? 4mks*Kyo*
   (c) State 2 other methods which could be used to determine the population. 1mk*Kyo*
2. a) Smokers are always at a high risk of suffering from respiratory infections. Explain. 3mks*Kyo*
   b) The gills of fish and the skin of the frog are efficient in the exchange of gases. Which characteristics do they have in common? 4mks*Kyo*
   c) Which structures are used for gaseous exchange in plants found in marine water. 1mk*Kyo*
3. The figure below is a pedigree diagram showing the inheritance of phenylketonuria a disease transmitted through a recessive gene.

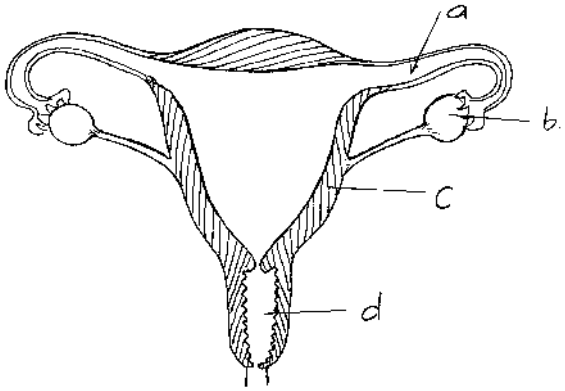


Key



Normal male
Phenylketonuric male
Normal female
Phenylketonuric female

   a) Using the symbols P for the normal gene and p for the phenylketonuric gene, write down the genotypes of the parents 1 and 2.
   Explanation 2mks*Kyo*
   b) Work out the possible genotypes of the normal child 4. 4mks*Kyo*
   c) Marriage between closely related individuals is always not advised in many communities. Give the biological explanation for this. 2mks*Kyo*
4. Study the diagram below and answer the questions that follow.



a

b

c

d

a) Which part(s) marked a-d, when defective after implantation may lead to abortion. Give a reason for your answer. 2mks*Kyo*

b) The part labelled b can be removed after 4 months of pregnancy without interfering with the pregnancy. Explain. 2mks*Kyo*

c) Under each of the following, state the name of the causative organisms.

i) Syphilis ½ mk*Kyo*

ii) Candidiasis ½ mk*Kyo*

iii) Gonorrhea ½ mk*Kyo*

iv) AIDS ½ mk*Kyo*

d) State 2 disadvantages of external fertilization. 2mks*Kyo*

5. a) Define the following terms.

i) Ingestion. 1mk*Kyo*

ii) Egestion 1mk*Kyo*

b) The breakdown of starch stops shortly after food enters the stomach. Explain 2mks*Kyo*

b) Give 2 non-nutrient components of a balanced diet and state the importance of each. 2mks*Kyo*

d) Highlight 2 functions of hydrochloric acid contained in gastric juice. 1mk*Kyo*

SECTION B (40 MARKS)

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

6. Carbohydrates used during respiration and those formed during photosynthesis by a certain plant was measured over a period of 24 hours at an interval of 3 hours

Time of day	12AM	3AM	6AM	9AM	12PM	3PM	6PM	9PM	11PM
carbohydrates formed during photosynthesis (mg)	0	0	5	30	60	30	5	0	0
Carbohydrates used during respiration (mg)	10	10	10	10	10	10	10	10	10

Using the same axes,

(a) plot a graph of carbohydrate formed during photosynthesis and carbohydrate used during respiration against time. 8mks*Kyo*

b) Calculate the net carbohydrate formed by the plant. 2mks*Kyo*

c) At what time of the day do the light compensation points occur? 2mks*Kyo*

d) Account for the shape of graph on carbohydrates.

(i) Between 12.00a.m and 3a.m. 2mks*Kyo*

(ii) Between 3.00a.m to 12.00noon. 2mks*Kyo*

e) How could foggy weather influence the net amount of carbohydrates formed over the 24 hour period? 1mk*Kyo*

f) Give other external factors apart from temperature and light intensity that influence the rate of photosynthesis. 2mks*Kyo*

g) In which form are carbohydrates stored in

(i) Plant bodies. ½ mk*Kyo*

(ii) Fungi. ½ mk*Kyo*

f) (a) What is homeostatis? 2mks*Kyo*

b) Discuss the homeostatic functions of the mammalian liver. 18mks*Kyo*

8. Discuss the adaptations seeds and fruits to dispersal. 20mks*Kyo*