NAME:.....ADM NO:.....CLASS.....

BIOLOGY

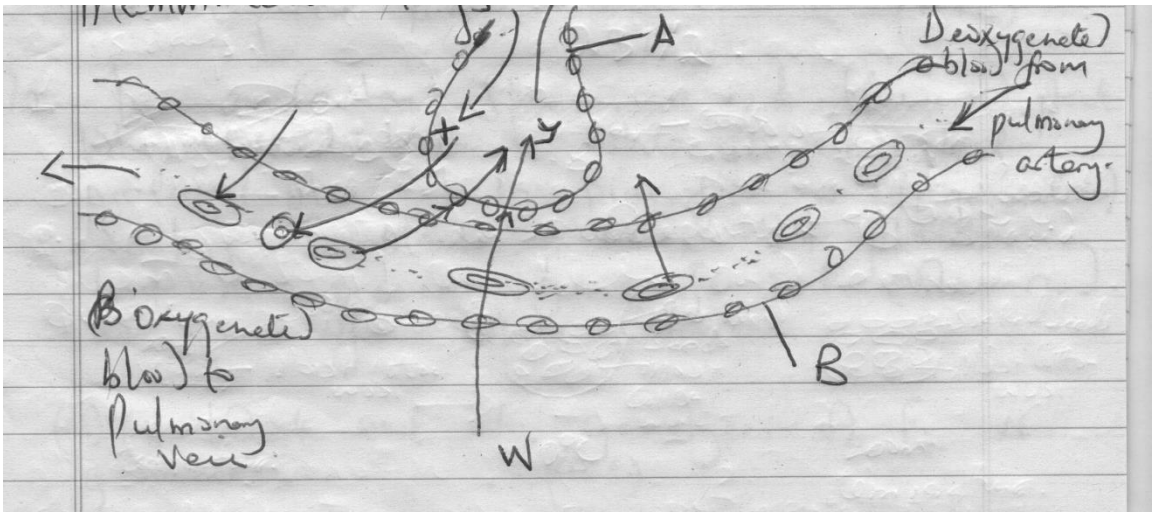
231/2

PAPER 2

INSTRUCTIONS: 1. Answer all the questions in section A and Question 6(compulsory) and either question 7 OR 8

SECTION 40 MARKS

1. The diagram below illustrates the mechanism of gaseous exchange in mammalian lungs.



a) i Name the membranes labeled ***A*** and ***B***. (2mks)

A-

B-

ii Name the gases labeled **X** and **W**. (2mks)

X---

W---

iii What factors of the alveoli adapt them to their functions. (2mks)

……

……

……

b) The following table shows the volume of gases carried by $100cm^3$ of blood

Gas	***Blood Entering lungs***	***Blood leaving lungs***
Nitrogen	$0.9cm^3$	$0.9cm^3$
Oxygen	$10.6cm^3$	$19cm^3$
Carbon (iv) Oxide	$58cm^3$	$50cm^3$

c) Explain the difference in the content of Oxygen and carbon (IV) oxide entering the lungs. (2mks)

……

……

2. In a certain species a red flowered plant when closed with a white flowered plant, produced plants with pink flowers (**F1** generation). Selfing **F1** plants produced 84 plants. Let R represent gene for red colour on W gene for white colour.

(a) i) Work out the genotypes of **F**2 generation. (4mks)

ii) What is the phenotypic ratio of **F2** plants? (1mk)

……

……

(b) How many **F2** plants had pink flowers? (2mks)

……

……

……

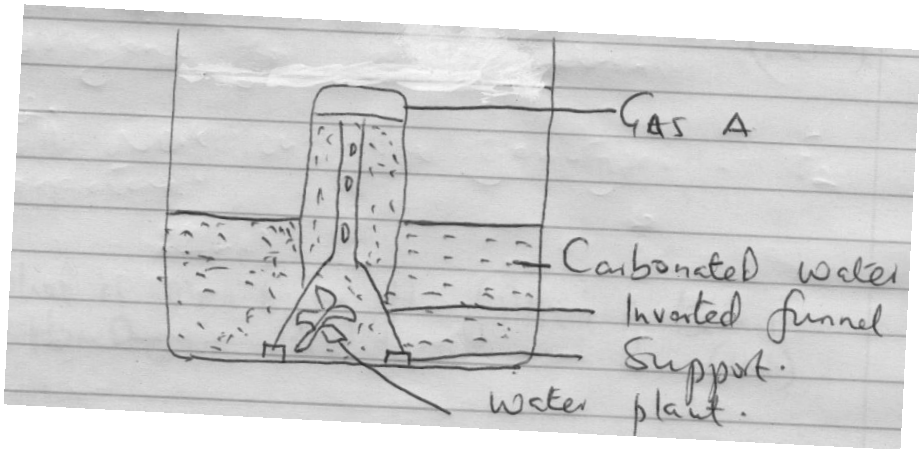
……

(c) Name the type of inheritance exhibited by the plants above. (1mk)

……

……

3. The set up below was assembled to demonstrate a certain physiological phenomenon. The set up was initially kept in a dark cupboard for 6 hours. Use it to answer the questions that follow.



(a) What was the aim of the set up? (2mks)

……

……

……

(b) Identify gas **A**.

i) When the set up was kept in a dark cupboard. (1mk)

……

……

ii) When the set up was exposed to sunlight. (1mk)

……

……

(c) Why is submerged water plant more suitable for the experiment that non-submerged water plant? (2mks)

……

……..

……

……

(d) Suggest **two** ways of increasing the rate of production of gas A. when the set up is exposed to sunlight. (2mks)

……

……..

……

……

4. a) What is the difference between *Darwinian* and *Larmackian* theories of evolution? (2mks)

……

……

……

b) What is meant by the following terms?

(i) Homologous structures. (1mk)

……

……

(ii) Analogous Structures. (1mk)

……

……

c) State the methods of fossil formation. (3mks)

……

……

……

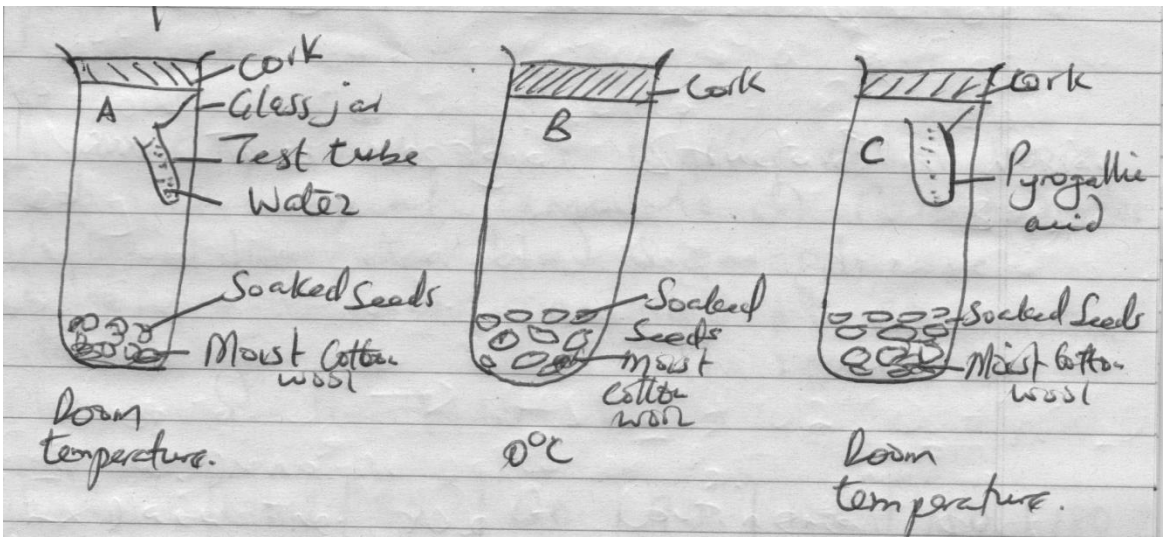
……

d) What is a vestigial structure? (1mk)

……

……

5. The diagram below represent set up to investigate the conditions necessary for seed germination. The Set up was left for 5 days.



i) What conditions were being investigated in the experiment? (2mks)

……

……

……

……

ii) Explain the role of water during seed germination . (2mks)

iii) State the observation made in glass jars A and B after five days. (2mks)

A……

……

B……

……

…

iv) Account for the results obtained in set up A and B after five days. (2mks)

A----

B ----

SECTION B: (40MKS)

QUESTION 6 is COMPULSARY: ***Answer either question 7 or 8.***

6. In an experiment, three healthy rabbits were fed with equal amounts of carbohydrates. After 1 hour their blood sugar glucose concentration was measured at 30 minutes intervals for 3 hour. The results are as shown in the table below.

Glucose conce Mg/ml Rabbit	**Initial time(minutes)**	**30 Minutes**	**60Minutes**	**90 Minutes**	**120 Minutes**	**150 Minutes**	**180 Minutes**
P	1.6	1.55	1.43	1.36	1.3	1.19	1.11
Q	1.49	1.39	1.34	1.32	1.27	1.2	1.09
R	1.59	1.39	1.33	1.27	1.18	1.1	0.99
Mean	1.56	1.44		1.32	1.25	1.16	-

a.(i) Calculate the **mea**n glucose concentration 1mg/ml of blood at 60 and 90 minutes. (2mks)

(ii) On the grid provided plot a graph of mean glucose concentration against time. (6mk)

(iii) What was the mean concentration in the blood after 75 minutes? (2mks)

(iv) Why was it necessary to use 3 rabbits in the experiment? (2mks)

……

……

……

(v) Account for differences in mean glucose concentration during the period. (3mks)

……

……

……

……..

(b) Name three products of digestion other than glucose

(3mks)

(c) What is the fate of excess glucose in plants? (2mks)

……

……

……

……..

Answer either Questions **7** or **8** on the Space provided

7. (a) How are xerophytes adapted to their environment? (10mks)
   (b) Explain the causes of seed dormancy. (10mks)

8. Describe how the male reproductive system is adapted to its functions. (20mks)