NAME: _____ ADM NO: _____CLASS: _____

CANDIDATE'S SIGNATURE: _____ DATE: _____

BIOLOGY

231/2

FORM THREE

END TERM 3 2024

TIME: 2 HOURS

Instructions to Candidates

- Write your **name**, and **ADM Number** in the spaces provided above.
- Sign and write the date of examination in the spaces provided above.

FOR EXAMINER'S USE ONLY

Questions	Maximum score	Candidates score
1 –5	40	
6-7 or 8	40	

SECTION A

ANSWER ALL QUESTIONS IN THIS SECTION

1. In an investigation, the approximate composition of plasma, glomerular filtrate and urine in a mammal was determined. The results were as shown in the table below.

Component	Plasma ($g/100cm^3$)	Glomerular ($g/100cm^3$)	Urine ($g/100cm^3$)
Urea	0.04	0.04	2.10
Uric acid	0.005	0.005	0.07
Glucose	0.20	0.20	0.00
Amino acids	0.07	0.07	0.00
Plasma protein	9.00	0.00	0.00
Salts	0.84	0.84	1.96

a) Account for the absence of

i) Plasma protein in glomerular filtrate

(2marks)

……

……

……

ii) Glucose and amino acids in urine (2marks)

……

……

……

b) From the above results, identify two types of wastes eliminated from mammalian blood.

(2marks)

……

……

……c) Other than excretion, give one other function of the mammalian kidney

(1mark)

……

……

……

……

d) State the principal requirement of filtration that forms glomerular filtrate

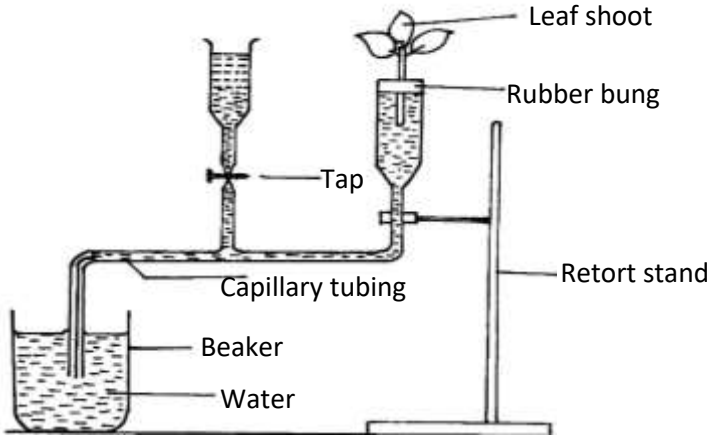
(1mark)

……

……

……

2. A set up that was used to investigate a certain process in plants as shown in the diagram below.



a) What process was being investigated?

(1mark)

……

b) What is the name given to the apparatus above (1mark)

……

c) State **one** precaution that should be taken when setting up the experiment. (1mark)

……

……

……

d) Give a reason for the precaution stated in (c) above. (1 mark)

……

……

……
……

e) State the changes that would occur to the rate of air bubble movement in each of the following condition, give a reason in each case.

i. When the plant was moved from sea level to a mountain peak at the same environmental conditions (2marks)

……
……
……
……

ii. When the leaves on the twigs were smeared with a film of Vaseline (2marks)

……
……
…….

3. A group of form three students estimated the population of grasshoppers in the school compound. They caught 240 grasshoppers, marked with white ink and then released them. After five days they caught 160 grasshoppers and found that 40 were marked.

a) Work out the population of grasshoppers in the compound. (3marks)

b) Name the instrument used in catching grasshoppers (1mark)

……..…….

c) State the method used in estimating the population of grasshoppers (1 mark)

……
……....

d) State the factors which would influence the results in the method identified above (3marks)

……

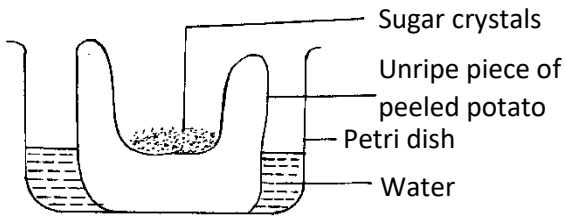
……

……

……

……

4. An experiment to investigate a certain physiological process was set up a shown below. After three hours it was observed that the level of the sugar solutions had risen.



a) Name the physiological process being investigated? (1mark)

……

b) Account for the rise of the level of sugar solution in the experiment (3mks)

……

……

……

……

c) State four roles of the above physiological process in plants (4 marks)

……

……

……

……

5. The diagram below is of a stage in cell division

a) With a reason identify the stage.

Stage …….. (1 mark)

Reason …… (2 marks)

b) i) What is the name given to the phenomenon above (1 mark)

……

……

ii) What is the importance of the above phenomenon named above (1 mark)

……

……..

c) State three activities that takes place during interphase of mitotic cell division (3 marks)

……

……

……

……

SECTION B

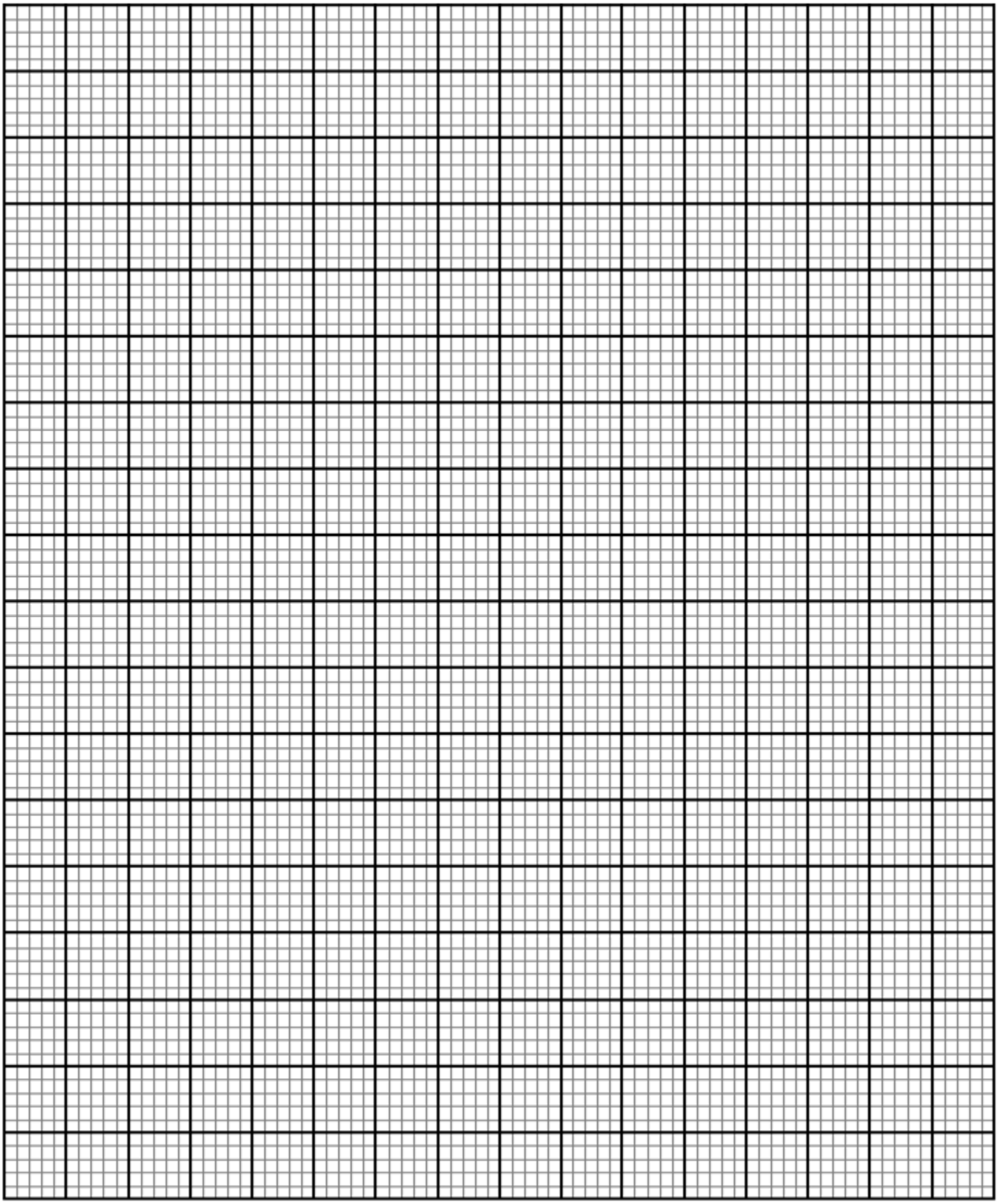
ANSWER QUESTION 6 (COMPULSORY) AND EITHER QUESTION 7 OR 8 IN THE SPACES PROVIDED AFTER QUESTION 8.

6. The table below show the rate if products formation for two enzymes, H and J over a range of pH value

pH	1	2	3	4	5	6	7	8	9	10
Rate of product formation for enzyme H (mg/hr)	34.5	40.5	33.5	15	-	-	-	-	-	-

Rate of product formation for enzyme J (mg/hr)	-	-	-	15	20	30	40.5	23.5	11	6

a) On the same axis, plot graphs of the rate of products formation against pH (8marks)



b) Account for the rate of product formation for enzyme H between (3marks)

i) pH 1 and 3

……

……

……

ii) pH 3 and 7

……

……

……

c) From the graph determine

i) The pH value at which the rate of product formation of the two enzymes was the same (1 mark)

……

……

ii) The value of the rate of product formation for enzyme H and J at the pH value stated in (c)(i) above (1 mark)

……

……

iii) The optimum pH value for the enzyme J. (1 mark)

……

……

d) State one variable that may lead to the change in the optimum rate of product formation of the two enzymes. (1 mark)

……

……

……

……

e) Suggest with a reason, the likely part of the human alimentary canal where enzyme H would be found. (2 marks)

……

……

……

7. Describe how mammalian heart is structurally adapted to its functions (20 marks)

8 a) Describe how xerophytes are adapted to living in their habitat . (10 marks)

b) Explain how abiotic factors affects plants (10 marks)