

NAME.....INDEXNO.....

SCHOOL.....SIGNATURE.....DATE.....

BUTULA SUB-COUNTY JOINT EXAMINATION

231/2

BIOLOGY THEORY

PAPER 2

DECEMBER 2021

2 HOURS

Instructions to candidates;

- ❖ Write your name, index number and name of your school in the spaces provided
- ❖ This paper consists of two parts A and B.
- ❖ Answer **ALL** questions in section A in the spaces provided
- ❖ In section B answer questions 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8.

FOR EXAMINERS ONLY

Section	Question	Maximum score	Candidates score
A	1	8	
	2	8	
	3	8	
	4	8	
B	5	8	
	6	20	
	7	20	
	8	20	
	Total score	80	

This paper consist of 10 printed pages.Candidates should check the question paper to ensure that all pages are printed.

1 .The table below shows variations in the form of carbon (IV) oxide is transported in the blood at rest and during physical exercise.

Form of transport	At rest (mole/litre)	During exercise(mole/litre)
Dissolved carbon (iv) oxide	0.52	0.97
Hydrogen carbonate ions	12.34	13.68
Carbon iv oxide bound to protein	0.26	0.16
Total carbon iv oxide in plasma	13.12	14.81
pH of blood	7.42	7.09

a) Explain why more carbon (IV) oxide is transported in the form of hydrogen carbonate ions. (3mks)

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b) Account for the high total plasma content of carbon (IV) oxide during exercise. (2mks)

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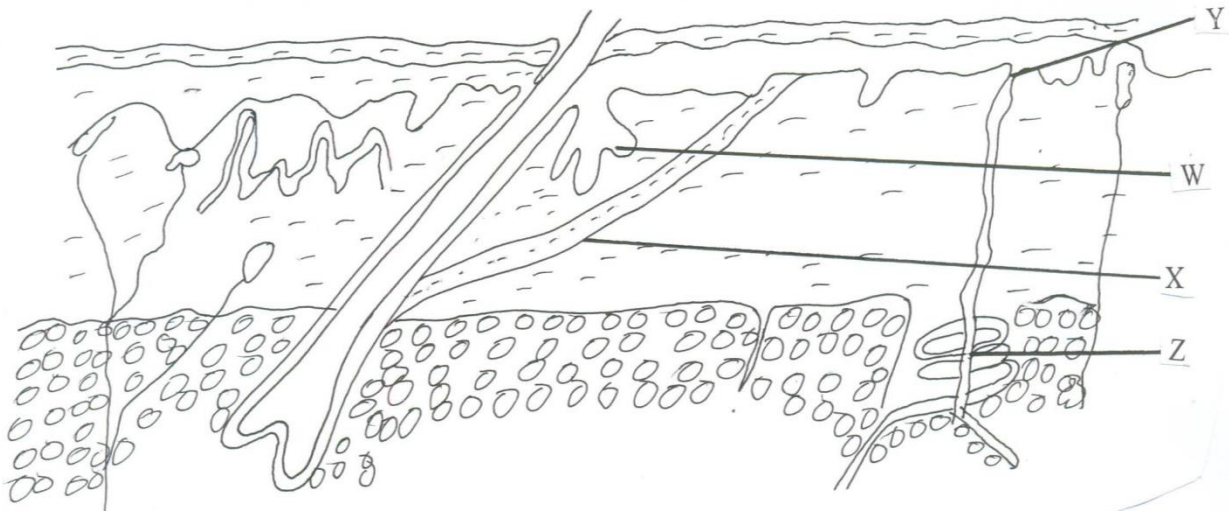
c) Explain how one's involvement in the exercises affects blood pH. (2mk)

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d) Name the protein responsible for transport of carbon (IV) oxide in the blood. (1mk)

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2. The diagram below shows a section through the mammalian skin



(a) Name the parts labelled W and X (2mks)

W.....

X.....

(b) State the function of the parts labelled Y and Z (2mks)

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(c) Explain the changes that occur in the skin when it is cold (4mks)

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3. a) Define the term genetics

(1mk)

.....

b) tufts of hair in the ear pinner is thought to be sex-linked characteristics found on the Y chromosome.

i. if a man hairy ears married a woman, what is the likelihood that all their sons would have hairy ears. Show your working. (4mks)

ii. Name other sex-linked characteristic found in man

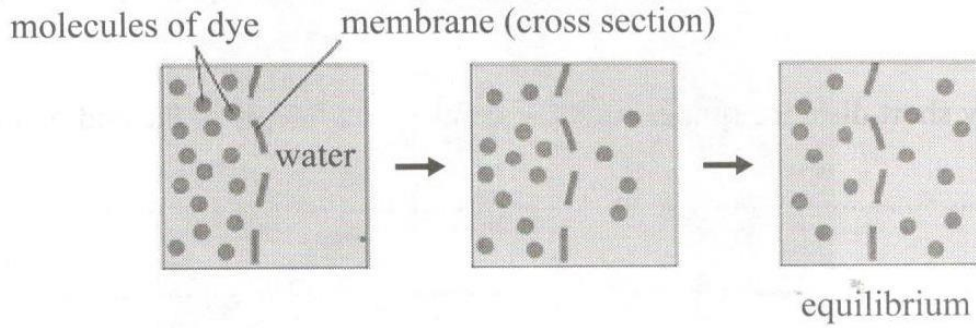
1mk

.....

C] Name two disorders due to non-disjunction.

.....
2mks

4. The set up below was used to investigate a certain physiological process.



a) Name the physiological process. (1mk)

.....

b) Give two examples of the process named in a) above in plants. (2mks)

.....

c) State two ways by which the movement of the dye in the set up would be slowed down. (2mks)

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d) What is the significance of diffusion in pollination? 1mk

.....

e) Differentiate between wall pressure and turgor pressure. 2mks

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5. During an ecological field work, a group of students caught 240 grasshoppers, marked them and then released them back to the study area. After one day they caught 160 grasshoppers and found that 40 were marked. Using the formula;

$$P = \frac{F.C.M \times S.C}{S.C.M}$$

Where P = Total population

F.C.M = First capture marked

S.C = Second capture

S.C.M = Second capture marked

a) Work out the total population of the grasshoppers in the study area. (2mrk)

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b) Identify the method used to capture the grasshoppers. (1mrk)

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c) Name the instrument and chemical the students used to collect and mark the grasshoppers.

(2mrks)

i) Instrument for collection

.....

ii) Chemical for marking

.....

d) State any **one** assumption the students made during the field work. (1mrk)

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a) The students observed the organisms and placed them into their correct phylum and class. Name the phylum and class.

i) Phylum.....

ii) Class

.....

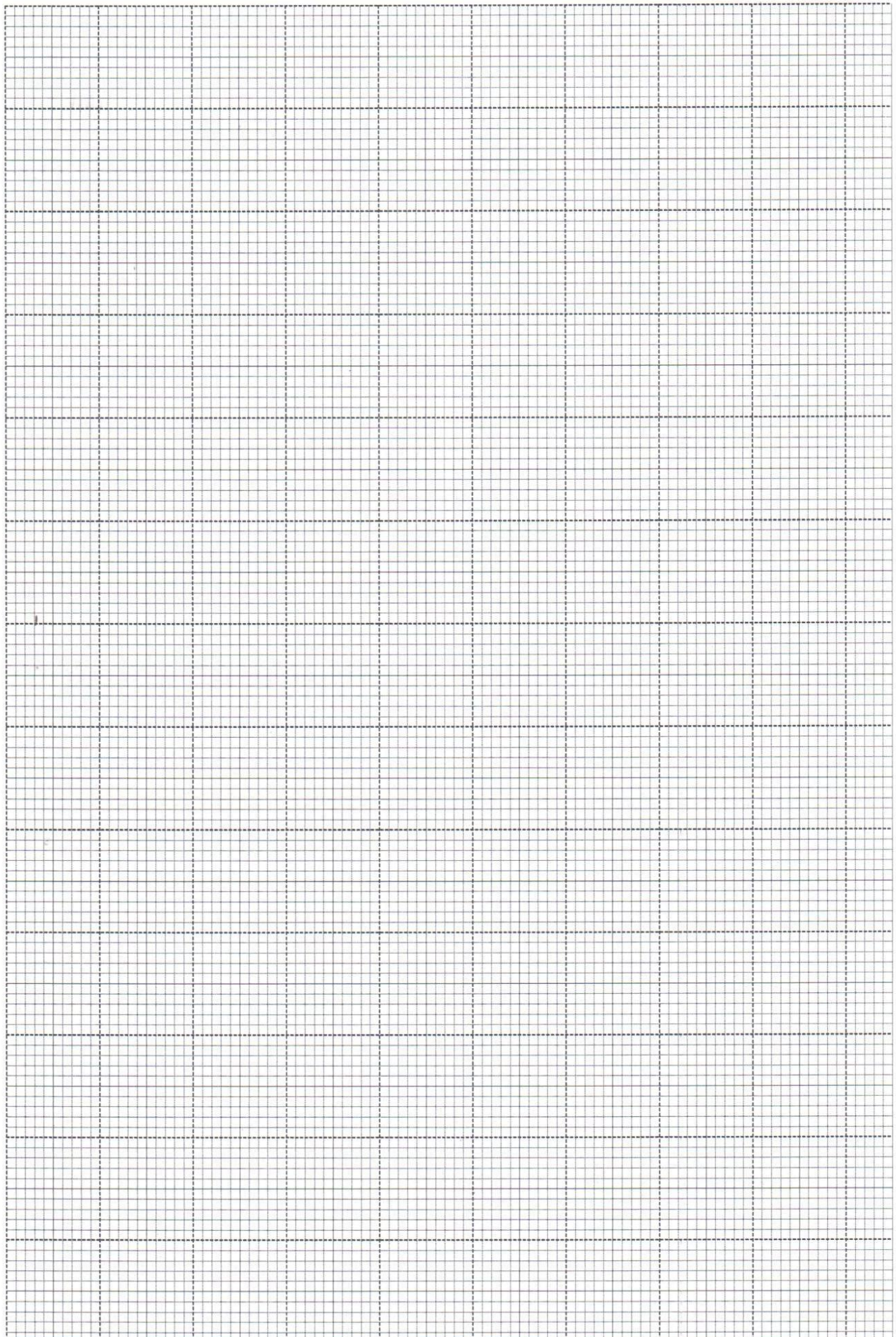
SECTION B (40MARKS)

Answer questions 6 (COMPULSORY) and Either question 7 or 8 in the spaces provided after the question 8.

6. Rice seeds were soaked overnight. Fresh mass and dry mass of a sample of 20 seeds was obtained and recorded in the table. The rest of the seeds were planted in a tray that had soil and well watered daily. Twenty of the seeds/seedlings were removed from the soil every two days for two weeks. Their fresh and dry mass were taken and recorded in the table as shown below.

Time in days	Fresh mass in (g)	Dry mass in (g)
0	14.0	4.0
2	18.0	3.5
4	24.5	2.5
6	32.0	1.5
8	38.5	2.0
10	41.0	3.0
12	43.0	4.5
14	45.0	6.0

- a) Using the same axes, plot two graphs to represent changes in fresh and dry mass over the two –week period (7mrks)



b) What would be the fresh and dry mass of the seedlings at day 9. (2mrks)

i) Fresh mass

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ii) Dry mass

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c) Account for the change in fresh mass and dry mass between day 0 and day 6.

(4mrks)

i) Fresh mass

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ii) Dry mass

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d) Explain the change in dry mass from day 8

(2mrks)

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e) Explain why a sample of 20 seeds was used instead of one seed.

(2mrks)

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f) *State one* factor within and one factor outside the seed that cause dormancy.

(2mrks)

i) Within the seed

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ii) Outside the seed

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