Name……... Adm No…… Class…….

Index No…….. School…….. Sign ……..

DATE ……..

231/2
BIOLOGY
PAPER 2
JUNE 2024
TIME: 2 HOURS

MIRROR JET EXAMS 2024

TERM TWO 2024

Kenya Certificate of Secondary Education. (K.C.S.E)

Instructions to the candidates

1. **Write your name and index number in the provided spaces**
2. **Write the date of the examination in the spaces provided**
3. **This paper consists of sections A & B**
4. **Answer all questions in section A in the spaces provided and in section B answer question 6 (compulsory and either question 7 or 8 in the spaces provided after the question 8)**

SECTION	QUESTION	MAX SCORE	CANDIDATES SCORE
A	1 2 3 4 5	8 8 8 8 8	
B	6 7 8	20 20 20	
	TOTAL	**100**	

SECTION A: 40MKS

ANSWER ALL QUESTION IN THE PROVIDED SPACES

1. State the functions of the following parts of the light microscope.
   a) i) Condenser (1 mk)

   ii) Eye piece lens. (1 mk)

   b) Give three advantages of using a cover lip when preparing a specimen for observation under a light microscope. (3mks)

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c) Explain how you would manipulate the low power objective lens to focus a specimen for observation under a light microscope. (3mks)

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2. In certain breeding experiments black rabbits were cross with pure breeding white rabbits and all the offspring had a coat with black and white patches.

a) Using letter B to represent the gene for black coat and letter H for white coat colour, work out the F2 genotypic ratio. (5mks)

b) State the phenotypic ratio of F2. (1mk)

c) i) Name the term used when two alleles in a heterozygous state are fully expressed phenotypically in an organism. (1mk)

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ii) Give an example of a trait in human beings where the condition whose term is named in (c) (i) above expresses itself. (1mks)

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3. a) State four characteristics of fruits dispersed by animals. (4mks)

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b) State two roles of each of the following hormones in menstruation.

i) Luteinising hormone. (2mks)

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ii) Oxytocin (2mks)

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4. a) Explain what happens when a wilting young plant is well watered. (3mks).

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b) Name a support tissue in plants thickened with:

i) Cellulose (1mk)

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ii) Lignin (1mk)

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c) Give three functions of pectoral and pelvic fins in a tilapia fish in Lake Victoria. (3mks)

5.

a) i) Explain the changes that take place in the pupil and lens of a human eye when a person moves from a brightly lit room to a dark room. (3mks)

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ii) What is the significance of the changes explained in (a)(i) above? (1mk)

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b) How is the human eye nourished? (2mks)

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c) Explain why images that form on the blind spot are not perceived. (2mks)

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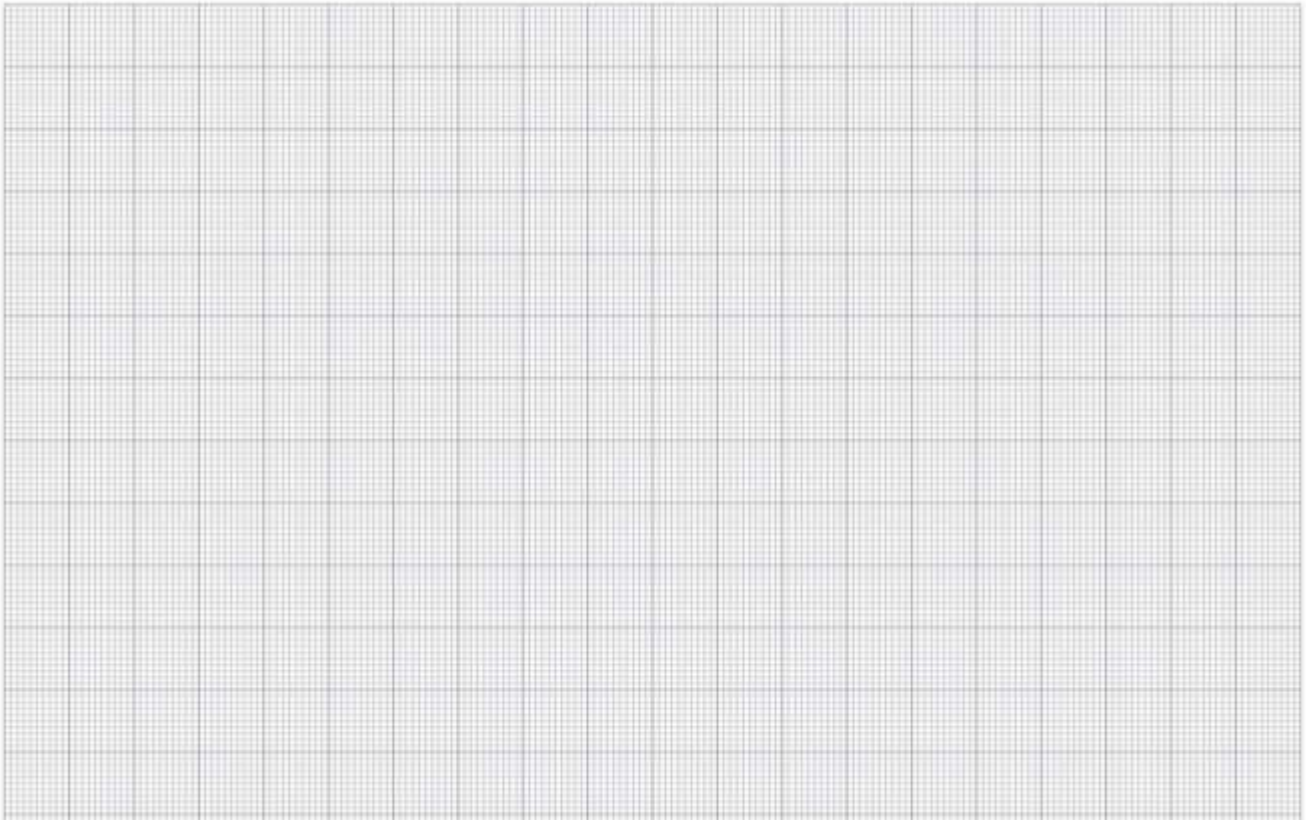
SECTION B (40mks)

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

6. A hungry person had after which the cultivation of glucose in the blood was determined. This was measured hourly as blood passed through the hepatic portal vein and the iliac vein in the leg. The results are shown in the table below.

Time (hrs)	**Concentration of glucose (mg/100ml) in**	
	Hepatic portal vein	**Iliac vein**
0	85	85
1	85	85
2	140	125
3	130	110
4	110	90
5	90	90
6	90	90
7	90	90

a) Using same axes, draw graphs of concentration of glucose in hepatic portal vein and the iliac vein against time. (7mks).



b) From your graph, determine the glucose level in the two blood vessels at 31/2hrs during the experiment. (2mks)

c) Account for the concentration of glucose in the hepatic portal vein from;

i. 0 – 1 hour (2mks)

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ii. 1 – 2 hours (3mk)

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iii. 2 – 4 hours (3mks)

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iv. 5 – 7 hours (2mks)

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d) Account for the difference in the concentration of glucose in hepatic portal vein and the iliac vein between 2 and 4 hours. (1mk)

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7. Describe the process by which free nitrogen in the air is made available to carnivores in the ecosystem. (20mks)

8. Explain how environmental factors affect the rate of transpiration in flowering plants. (20mks)