**NAME………………………………………………………….. ADM. NO……………………**

**ITETANI GIRLS’ HIGH SCHOOL**

**P.O. BOX 2220 – 90100**

**MACHAKOS**

**TERM ONE, 2018**

**FORM FOUR**

**BIOLOGY 231/2**

**SECTION A: ANSWER ALL THE QUESTIONS IN THIS SECTION (40 MARKS)**

1. Form one students set up the experiment below:
2. What was the aim of the experiment (1 Mark)

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1. What is the identity of gas Q (1 Mark)

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1. Give a reason as to why *Elodea* was a suitable specimen for this experiment (2 Marks)

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1. Other than gas Q, what is the other product of the process above? (1 Mark)

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1. What would be the effect of increasing the temperature of the water? (2 Marks)

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1. What is the effect of adding sodium hydrogen carbonate to the water? (1 Mark)

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2. Study the diagram below and answer the questions that follow:
3. What is the name given to the structures shown above? (1 Mark)

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1. Name the parts labeled: (2 Marks)

M-…………………………………………………………………….

N-……………………………………………………………………

1. Explain the differences in adaptation between structure K and L, and hence explain the advantage of K over L (3 Mark)

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1. State any two parts of the mammalian kidney where structure K is most likely to be found. (2 Marks)

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2. Using the appropriate examples, define the following terms as used in the nitrogen cycle:
3. Symbiosis (3 Marks)

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1. Saprophytism (3 Marks)

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1. On a field trip to a game reserve, students observed a lion, a gazelle and a pastoralist looking after his cattle. From this ecosystem, construct two food chains containing tertiary consumers. (2 Marks)

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2. Differentiate between a dominant gene and a recessive gene. (2 Marks)

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1. In beans, the gene for purple colour is dominant over the gene for white colour. A pure breeding bean plant with purple colour was crossed with a heterozygous bean plant. Construct a genetic cross to show the phenotypes of the F1 generation. (4 Marks)

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2. Osmosis is said to be ‘selective diffusion’. Explain. (2 Marks)

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1. State any two roles of active transport in animals. (2 Marks)

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1. Explain the role of a long loop of henle in a desert rat. (2 Marks)

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1. Explain why members of the class aves excrete uric acid and not ammonia (2 Marks)

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**SECTION B: ATTEMPT QUESTION SIX (COMPULSORY QUESTION) AND CHOOSE ONE QUESTION BETWEEN QUESTION 7 AND 8. 40 MARKS.**

1. Form four students determined the height of all students in the school in centimetres and recorded their findings in the table below:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| HEIGHT IN METRES | 1 | 1.1 | 1.2 | 1.3 | 1.35 | 1.4 | 1.5 | 1.6 |
| NUMBER OF STUDENTS | 5 | 7 | 17 | 40 | 52 | 42 | 20 | 10 |

1. Using the grid provided, plot a graph of numbers of students against height. (7 Marks)
3. Account for the shape of the curve between 1 metre and 1.1 metres. (2 Marks)

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1. Account for the shape of the curve between 1.3 metres and 1.4 metres (2 Marks)

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1. Name the type of variation shown above (1 Mark)

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1. Other than height, name any other two characteristics which exhibit the type of variation named in c) above. (2 Marks)

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1. In a biological cross, it was observed that all F1 generation garden peas were tall, despite one of the parental stock being dwarf. Given that the gene for tallness is dominant over the gene for dwarfness;
2. Determine the genotype of the other parental stock. (1 Mark)

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1. Determine the phenotypic ratio of the F2 generation if the F1 generation was selfed to obtain F2 generation. (4 Mark)

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1. Given that 250 garden peas in the F2 generation were dwarf, determine the total number of garden peas in the F2 generation.

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1. Explain how the kidney nephrone is adapted to perform its functions. (20 Marks)
2. Describe the role of plant hormones in growth and development. (20 Marks)

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