**COUNTY LINK GROUP**

**COMMON EXAMINATION**

**END OF TERM II FORM 4 -2017**

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

**SCHOOL …………………………………………………… .SIGN …………………………………...**

**DATE…………………………………………………………………………………………………….**

**231/2**

**BIOLOGY PAPER 2**

**JULY 2017**

**2 HOURS**

**Instructions to candidates:**

1. Write your name and index number in the space provided
2. Answer all the questions in sections A in the space provided
3. In sections B answer questions 6 (compulsory) and either questions 7 or 8 in the space provided after questions 8
4. (a) The diagram below shows a part of a nucleic acid strand



1. Identify the nucleic acid strand above (1mk)
2. Give a reason for your answer in (a) (i) above (1mk)

(b) A pure breed of red cows and pure breed of white bulls were crossed to give F1 calves which

had a mixture of red and white fur, known as roan. The F1 were selfed.

1. Using letter R to represent gene for red colour and W to represent gene for white colour, work out the phenotypic ratio of the F2. (4mks)
2. In human couples, the sex of a baby is determined by man. Explain (2mks)
3. Study the diagram below and answer the equations that follow



1. Name the part labeled A (1mk)
2. State the functions of the parts labeled B and C (2mks)

B………………………………….

C…………………………………

1. State any three adaptations of the part labeled D to its functions (3mks)
2. Name the structures that perform the same function as p[art labeled D in :
3. Amoeba (1mk)
4. Fish (1mk)
5. The flow chart below shows a feeding relationship in an aquatic ecosystem. Study it and answer the questions that follow



1. Name the:
2. Producers in the ecosystem (1mk)
3. Organisms that occupy the highest trophic level (1mk)
4. Write a food chain that ends with hawks as tertiary consumer (1mk)
5. If all the small fish died, State two short terms effects on the ecosystems (2mks)
6. Oil spills on water bodies lead to death of fish Explain (1mk)
7. What is an ecosystem ?
8. State one reason why biomass decreases as you move from a lower trophic level to a higher trophic level (1mk)
9. The table below shows results of a study of three plants A, B and C growing in different habitats

|  |  |  |  |
| --- | --- | --- | --- |
| Feature  | Plant A | Plant B | Plant C |
| Number of stomata on the upper surface of leaf per squire area | 3 | 21 | 9 |
| Number of stomata on lower surface of leaf per squire area | 7 | 0 | 9 |
| Thickness of cuticle of the leaf | 0.5 | 0.2 | 0.3 |
| Surface area of roots  | 2100 | 1100 | 1300 |

1. (i) Which of the three leaves would be expected to have lower rate of transpirations? (1mk)
2. Give reasons for your answer in (a) (i) above (2mks)
3. Explain why waterlogged soils do not support plant growth (3mks)
4. State the importance of transpiration to plants. (2mks)
5. The diagram below illustrates an experiment to determine the rate of respiration in a small insect.



1. State the functions of the chemical component labeled X (1mk)
2. What changes would you expect to observe in the level of the coloured water in the capillary tube after the experiment has run for 5 minutes (1mk)
3. Account for the change you have stated in (b) above (3mks)
4. State three industrial applications of anaerobic respirations (3mks)

Section B (40mks)

1. A study involving 50 persons was carried out to establish the effect of environmental temperature on mean urine and sweat production. The results obtained are shown below.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Environmental temp ($0\_{C}$) | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 |
| Mean uraine productions (cc/h) | 120 | 95 | 82 | 73 | 62 | 53 | 44 | 32 |
| Means sweat production (cc/h) | 5 | 10 | 15 | 30 | 35 | 55 | 125 | 210 |

1. On the same axis on the graph paper provided, draw graphs of mean urine production and mean sweat production against environmental temperature (8mks)
2. At what temperature was urine production equal to sweat production (2mks)
3. Explain the relationship between Sweat and urine production (2mks)
4. Explain the changes that occur in the skin when body temperature rises above $37.8\_{C}^{0}$ (6mks)
5. State three adaptations of loop of henle to its functions (3mks)
6. Describe the role of hormones in the human menstrual cycle (20mks)
7. Describe the uptake and movement of water from the soil to the leaves of a tall plant till transpiration (20mks)