**P530/2**

**BIOLOGY**

**(THEORY)**

**21/2hours**

**KISORO VISISON S.S INTERNAL EXAMINATION (SET TWO) JULY 2019**

**Uganda advanced certificate of education**

**BIOLOGY**

**paper 2**

**2hours 30 minutes**

**INSTRUCTIONS TO CANDIDATES**

1. This paper consists of 2 sections, A and B.
2. Answer question one in section A and plus three other questions in section B
3. Any additional questions will not be marked.
4. Candidates are advised to read the questions carefully; organize their answers and present them precisely and logically.
5. Illustrate with diagrams wherever necessary.

**SECTION ,40 MARKS (compulsory question)**

The figure below shows the pressure changes in the buccal and opercular cavities of a teleost fish obtained by using hypodermic tubing connected to a pressure recorder. Negative pressure indicates expansion while positive pressures mean contraction of the cavities.



The table below summarizes the features of gills in three species of teleost fish A, B and C.

|  |  |  |  |
| --- | --- | --- | --- |
| Fish species | Thickness of lamellae/µm | Distance between lamellae/µm | Distance between blood and surrounding water |
| A | 35 | 75 | 6 |
| B | 15 | 40 | 3 |
| C | 5 | 20 | 1 |

1. Describe the pressure changes in the buccal cavity for the first 0.5 seconds. ***(05 marks****)*
2. Compare the pressure changes in the buccal cavity and opercular cavity in the first 0.4 seconds. ***(08 marks****)*

c(i) Explain the observed changes in the buccal cavity and opercular cavity from 0.2 seconds to 0.6 seconds. *(****10 marks****)*

(ii) What is the physiological significance of the differences between the pressure in the buccal and opercular cavities?*)* ***(06 marks***

d Explain the significance of the features of the gills in the table in gas exchange. *(06 marks)*

(e) Blood in the lamellae of the teleost fish flows in opposite direction to that of water. Comment on the efficiency of this mechanism in gas exchange. *(05 marks)*

**SECTION B 60 MARKS (choose 3 question*s****)*

2(a) Derive the **Hardy-Weinberg** equation from first principles **(10 marks)**

(b) Describe how;

(**i) Random mating**

**(ii)Genetic drift**

affect the allele frequency of a sexually reproducing population. **(10 marks)**

3 Discuss the significance of colour in plants and animals **(20 marks)**

4 a) Discuss the role of aortic and carotid bodies in regulating respiration rate in mammals. **(6marks**)

(b) Describe the changes that occur in the body of an athlete just before and after a race (**14 marks)**

**5 (a)** Distinguish between negative and positive mechanisms and why positive feedback mechanisms are rare in biological systems **(03 marks)**

.**(**b) Explain how important positive feedback mechanisms are important in a human biological systems **(10 marks)**

**(c**) Explain the negative feedback with reference to blood sugar control**. (07 marks)**

6(a) Describe the process by which xylem vessels are formed in stems of dicotyledonous plants **(10**

(b) Explain the role of transpiration in the transport of water from the soil to the leaf cell**s (10**

**‘SCIENCE IS THE THING’**

**Tr laban Duncans**