**BIOLOGY**

**29/06/2021 08.30 AM - 11.30 AM**

**28/11/2017 08.30 AM - 11.30 AM**

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**S5 END OF YEAR EXAM, 2020/2021**

**SUBJECT: BIOLOGY**

**COMBINATIONS: - PHYSICS-CHEMISTRY-BIOLOGY (PCB)**

 **-MATH- CHEMISTRY-BIOLOGY (MCB)**

 **- BIOLOGY-CHEMISTRY-GEOGRAPHY (BCG)**

**DURATION: 3 hours.**

**Marks: 100**

**INSTRUCTIONS TO CANDIDATES:**

* Do not open this question paper until you are told to do so.
* **Section A**: Attempt **all** questions **.( 70 marks )**
* **Section B:** Attempt any **three** questions of your choice. **( 30 marks)**

**SECTION A:** Attempt **all** questions **(70 marks)**

1) Distinguish between

 a) Community and Population **(2 marks)**

 b) Abiotic and biotic factors **(2 marks)**

 c) Ecosystem and ecological niche. **(2 marks)**

2) Describe how a parasite is able to live in the host. **(5 marks)**

3) Copy and complete the table below using a tick **(√)** or a cross(**X**) in the

 appropriate box.

|  |  |  |  |
| --- | --- | --- | --- |
| **Process** | **Uses energy in the form of ATP** | **Uses protein** | **Controllable by cells** |
| Diffusion |  |  |  |
| Osmosis |  |  |  |
| Facilitated diffusion |  |  |  |
| Active transport |  |  |  |
| Endocytosis and exocytosis |  |  |  |

 **(5 marks)**

4) Explain why a single cell organism such as amoeba can gain enough oxygen for its respiration through simple diffusion across its membrane.

 **(2 marks)**

5 a) Explain why nucleic acids are named after the sugar they contain.

 **(2 marks)**

 b) A DNA strand has the base sequence ATTAGGCTAT. Write down the

 complementary strand sequence**. (2 marks)**

c) A DNA molecule is 20% Thymine(T). What percentage of each of the other

 types of base would it contain? **(2 marks)**

6) Compare and contrast the structure of DNA and RNA. **(6 marks)**

7 a) Distinguish between a codon and anticodon **(2 marks)**

 b) Explain why a genetic code is described as:

 (i) Universal **(1 mark)**

 (ii) Degenerate  **(1 mark)**

 (iii) Non-overlapping  **(1 mark)**

8 a) Name three molecules involved in carbon dioxide fixation **(3 marks)**

 b) What is the role of NADPH in the Calvin cycle  **(1 mark)**

 c) Describe two functions of ATP in the Calvin Cycle **(2 marks)**

9 a) Distinguish between the light-dependent reactions and carbon dioxide

 fixation reactions of photosynthesis. **(4 marks)**

 b) State the importance of Photosynthesis in plants and other organisms.

 **(2 marks)**

10) a) Explain why smoking is a difficult habit to stop. **(2 marks)**

 b) State three ways that can be used in tobacco control. **(2 marks)**

11 a) Explain the importance of maintaining a constant internal

 temperature in humans. **(2 marks)**

 b) Describe the role of the hypothalamus in the regulation of body

 temperature. **(2 marks)**

c) Explain why in a normal healthy individual, the blood glucose level

 fluctuates very little. **(2 marks)**

12 a) In human cell, there are 46 chromosomes. Which part of the cell

 contains chromosomes. **(1 mark)**

 b) A person’s sex is determined by their sex chromosomes. Explain

 why it is impossible for identical twins to be a girl and a boy.

 (**3 marks**)

 c) Cloning is an artificial process to produce offsprings which are

 genetically identical to their parents. Suggest some of the potential

 problems with producing animals by this method. **(4 marks)**

13 a) Name the factors that make malaria a difficult disease to control

 **(3 marks)**

 b) Explain why there is a high risk of cholera in refugee camps.

 **(2 marks)**

 **SECTION B (30 MARKS)**

 **Answer ONLY three questions**

1. ) a) Describe what is meant by the following terms.

(i) Community

 (ii) Ecosystem

 (iii) Food chains

 **(3 marks)**

 b) Evaluate the use of studying food webs, rather than food chains in

 Ecology. **(3 marks)**

 c) How is energy lost while passing through trophic levels. **(4 marks)**

15) Describe the pathway and mechanism by which water is transported

 through a flowering plant from the soil to the atmosphere. **(10 marks)**

16) Discuss the various effects of Insulin hormone in man. **(10 marks)**

17) Transpiration is a necessary evil. Discuss. **(10 marks)**

18 a) What is meant by Mitosis?  **( 2 marks)**

b) What is the importance of Mitosis? **(8 marks)**