**BIOLOGY**

**22/11/2019 08.30 AM - 11.30 AM**

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

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**S4 END OF YEAR EXAM, 2019**

**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 (Compulsory) (70 marks)**

1. Name any four characteristics of Fungi. **(4 marks)**
2. a) Describe the structure of Mitochondria. **(2 marks)**

b) What are functions of Mitochondria? **(2 marks)**

 3) The amoeba is single celled organism that lives in water. Describe how

 amoeba engulfs particles of food by endocytosis **(2 marks)**

1. Explain why HIV virus has such devastating effects on our body’s

ability to fight diseases. **(2 marks)**

1. a) Describe the roles of carrier proteins in active transport. **(2 marks)**

b) Explain why the carrier proteins used for facilitated diffusion have a variety of different shape **(1 mark)**

 6) a) Maltose is a dissacharide and glucose is a monosaccharide. Describe

 one similarity they have in common **(2 marks)**

 b) Athletes are given glucose instead of maltose. Give reasons why?

1. **marks)**

7a) Mature people who have stopped growing still need proteins in

 their diet. Explain why? **(2 marks)**

 b) An adult man needs about 60 g of proteins per day. Why does he gain

 nothing if he eats more than this? (**2 marks)**

 8) Suggest why mRNA is less stable than DNA, and why is this a necessary

 feature of mRNA. **(4 marks)**

9) Hormones and Enzymes are similar in that they are both effective in very

 small amounts and they are not consumed in the metabolic processes

 they affect. Suggest how Hormones and Enzymes differ. **(4 marks)**

 10 a) Define the term Locomotion. **(1 mark)**

 b) What is the basic reason for the fact that animals show locomotion

 whereas plants do not. **(3 marks)**

11 a) What would happen to the activity of the intestinal enzymes if the PH

 in the duodenum remains at 2? **(2 marks)**

 b) Why is it necessary for enzyme Pepsin to be secreted in inactive form?

 **(2 marks)**

 12) Briefly explain the roles of each of the following in mammalian

 locomotion.

1. Ligament **(2 marks)**
2. Tendon **(2 marks)**
3. Bones **(2 marks)**

 13 a) Explain why an enzyme which catalyses the conversion of Protein into

 maltose is unable to catalyse the conversion of Protein into amino

 acids. **(2 marks)**

 b) Explain why enzymes are so specific in the reaction that they

 catalyse. **(2 marks)**

c) Suggest why all enzymes are protein molecules. **(2 marks)**

14 a) Define the term biotechnology. **(2 marks)**

 b) State two advantages of treating diabetes with insulin produced

 by gene technology. **(2 marks)**

15 a) Plasmodium falciparum is the causative agent of the most form of

 Malaria. It is distributed throughout the tropics. Explain why Malaria

 is restricted to the tropics. **(2 marks)**

 b) Explain why it is has proved difficult to develop a vaccine for malaria.

 **(4 marks)**

 16) Suggest why it is difficult to decide whether Viruses are living

 organisms. **(4 marks)**

 17) This question is about cell division.

 Complete the table below by putting a tick in the correct column.

 **(5 marks)**

|  |  |  |
| --- | --- | --- |
| **No** | **Feature** | **Type of cell division** |
| **Meiosis** | **Mitosis** |
| 1 | Changes take place in the Nucleus | **√** | **√** |
| 2 | Produces gametes |  |  |
| 3 | Produces daughter cells with identical chromosomes |  |  |
| 4 | Half chromosomes are passed to each daughter cell |  |  |
| 5 | Homologous chromosomes are randomly assorted into daughter cells |  |  |
| 6 | Mutations can occur to change the genetic code |  |  |

 **SECTION B (30 MARKS)**

18) Write an account of the cell cycle, involving a mitotic nuclear

 division, highlighting the events occurring in each stage. **(10 marks)**

19) Give differences and similarities between DNA and RNA Molecules.

 **(10 marks)**

20) Describe the various biological functions of water to plants and animals

 **(10 marks)**

21) Plants reproduce both sexually and asexually. Discuss the advantages

 and disadvantages of both processes to plants. **(10 marks)**

22 a) Define the term Enzyme **(2 marks)**

b) What are characteristics of enzymes? **(6 marks)**

c) How enzymes differ from catalysts? **(2 marks)**