

Bihar Engineering University, Patna
End Semester Examination - 2022

Course: B.Tech.
Code: 100708

Semester: VII
Subject: BIOLOGY FOR ENGINEERS

Time: 03 Hours
Full Marks: 70

Instructions:-

- (i) The marks are indicated in the right-hand margin.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question No. 1 is compulsory.

Q.1 Choose the correct answer of the following (any seven Question):

[2 x 7 = 14]

- (a) Denaturation of protein involves breaking of several bonds except:
 - (i) Electrostatic bond
 - (ii) Disulfide bond
 - (iii) Hydrogen bond
 - (iv) Peptide bond
- (b) Name the process of gaseous exchange in the body?
 - (i) Lymphatic System
 - (ii) Respiration
 - (iii) Cardiovascular System
 - (iv) Reproduction
- (c) 'ABO' system of blood measures the
 - (i) protein
 - (ii) sugar
 - (iii) antibody
 - (iv) antigen
- (d) Which of the following is protein hormone?
 - (i) Oxytocin
 - (ii) Insulin
 - (iii) TSH
 - (iv) Antidiuretic Hormone
- (e) The term 'biology' was introduced by
 - (i) Lamarck and Traviranus
 - (ii) Drawin
 - (iii) John Ray
 - (iv) Aristotle
- (f) An organism carrying two identical alleles is
 - (i) recessive
 - (ii) heterozygous
 - (iii) homozygous
 - (iv) dominant
- (g) Which enzyme join DNA molecules together?
 - (i) Polymerase
 - (ii) Nucleases
 - (iii) Ligases
 - (iv) Linkers

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- (h) Exception to Mendal's law of genetics is / are
 (i) Linkage
 (ii) Pleiotropism
 (iii) Polyploidy
 (iv) All of the above
- (i) The longest part of the cell cycle is
 (i) prophase
 (ii) metaphase
 (iii) interphase
 (iv) telophase
- (j) COVID-19 (Coronavirus) contains genetic material as
 (i) Single stranded DNA
 (ii) Double stranded RNA
 (iii) Single stranded RNA
 (iv) Double stranded DNA

Q.2 (a) Distinguish between Meiosis and Mitosis? Describe Mendel's Law. [7]
 (b) Describe the mechanism of mitosis cell division. [7]

Q.3 (a) What do you mean by Respiration? Explain the types of Respiration. [7]
 (b) Differentiate between autotroph and heterotroph organisms. [7]

Q.4 (a) Write in brief properties and examples of all three major kingdoms of life. [7]
 (b) What is glycolysis? Draw the flow diagram of different stages of glycolysis showing preparatory and payoff phase. [7]

Q.5 (a) Explain the structure of DNA in details. [7]
 (b) Differentiate between gene interaction and epistasis. [7]

Q.6 (a) Define metabolism and differentiate between endergonic and exergonic reaction. [7]
 (b) What is the difference between unicellular and multi-cellular organisms? [7]

Q.7 Draw a well-labelled diagram of animal and plant cell and list specific functions of each cell organ. [14]

Q.8 (a) Explain hierarchy of DNA structure for monomeric nucleotide to double helical polymeric form associated with histone proteins of nucleosome. [7]
 (b) Draw the Krebs / TCA Cycle diagram and mark the net source and total number of ATP generated in Krebs/TCA cycle. [7]

Q.9 What is modern biology ? Distinguish between traditional and modern biology. [14]