

**Birla Institute of Technology and Sciences, Pilani, Pilani-Campus, Rajasthan
Comprehensive Examination (CLOSED BOOK)**

I Semester 2022-2023

Course Name: Biological Chemistry

Course Code: PHA F242

Date: 19/12/2022

Duration: 120 min

Max. Marks: 25

Instructions

1. All questions are compulsory.
 2. Write correct question number in answer sheets.
 3. Draw structures, diagrams and mention enzymes along with co-factor in all pathways and reactions.
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1. Explain in detail with examples (wherever necessary): [2+4+2]
 - (i) "homotropic allosteric modulation" of enzyme.
 - (ii) The role of four important amino acids in nitrogen metabolism.
 - (iii) Why Allopurinol is given to patients suffering from gout.
2. Enzyme kinetics is one way to understand the mechanism of enzymes action. Giving the assumptions, derive the Michaelis-Menten equation. [4]
3. Biosynthesis of fatty acids requires acetyl Co-A and NADPH. Explain the entire process of formation of palmitic acid in humans. Give the stoichiometric equation for this pathway. [7]
4. Electron transport chain creates a proton gradient across the inner membrane of mitochondria. Describe the formation of ATP by ATP Synthase (Complex V) from this gradient. [6]

**Birla Institute of Technology and Sciences, Pilani, Pilani-Campus, Rajasthan
Comprehensive Exam (OPEN BOOK)**

I Semester 2022-2023

Course Name: Biological Chemistry

Course Code: PHA F242

Date: 19/12/2022

Duration: 60 min

Max. Marks: 10

Instructions

- 1. All questions are compulsory.**
- 2. Write correct question number in answer sheets.**
- 3. Draw structures wherever required.**

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1. An enzyme-catalyzed reaction that obeys Michaelis-Menten kinetics, is said to be a first-order with respect to substrate at low substrate concentrations, and zero-order with respect to substrate at higher substrate concentrations. Explain with the help of Michaelis Menton equation. [3]

2. Explain the following giving examples: [2+1+2+1+1]

(i) How phosphorylation can both activate and inactivate proteins

(ii) Thymine is present only in DNA.

(iii) NADH is considered equivalent to 2.5 to 3 ATPs

(iv) A drug having structural similarity to glutamine will inhibit incorporation of which nitrogen of purine ring.

(v) Bone marrow transplant is not permanent cure for ADA deficiency.