

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

**I Semester 2023-2024**

**Course Name: Biological Chemistry**

**Course Code: PHA F242**

**Date: 09/12/2023**

**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.**
- .....

1. Nucleotides play diverse biological roles in the cells. Explain the entire *de novo* process for the synthesis of deoxythymidine monophosphate. What is the rationale for clinical application of Fluorouracil and methotrexate as anti-neoplastic therapy? [8+3=11]
2. Explain in detail with examples (wherever necessary): [3+3+1=7]
  - (i) Mechanism of activation of clotting factors by Vitamin K.
  - (ii) Why are aromatic acids used in the treatment of genetic defects in the urea cycle?
  - (iii) How are decouplers useful to hibernating Animals?
3. The catabolic processes in different tissues/cells lead to the production of ammonia that is carried to the liver in the form of glutamate, glutamine, or alanine. Draw the entire process of conversion of these substances to urea. [7]

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

**I Semester 2023-2024**

**Course Name: Biological Chemistry**

**Course Code: PHA F242**

**Date: 09/12/2023**

**Duration: 60 min**

**Max. Marks: 15**

**Instructions**

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

**1. Two cysteine residues in a protein form a disulfide bond. Do you think a slight change in pH would affect this in physiological condition? Do you think it is thermodynamically favoured? Give reasons for your answer. [3]**

**2. Discuss in detail different types of Niemann-Pick disease, mentioning cause, targeted population and disease manifestations specific to each type. [4]**

**2. Explain the following:**

**[3+1+2+2=8]**

**(i) Use of Anastrozole in treatment of hormone-sensitive breast cancer in post-menopausal women.**

**(ii) Grilled food has some amount of D-form of amino acids. How are they catabolized?**

**(iii) Why FMN and FAD have multiple oxidation states**

**(iv) What is the advantage of multi-step carnitine shuttle system when in mitochondria fatty acid again transforms to Fatty acyl Co-A?**