

BCHET-149: Basic Analytical Chemistry

Course Code	BCHET-149
Course Title / Subject	Basic Analytical Chemistry
Programme	B.Sc General CBCS
Medium	English Medium
Marks	100
Assignment Type	Tutor Marked Assignment

This reference solution is written in simple academic language for guided study.

Official Assignment / Syllabus Page

Rendered from the official IGNOU assignment PDF.

ASSIGNMENT Molecules of Life Elective Course in Chemistry

Course Code: BCHET-149
Assignment Code: BCHET/TMA/2025
Maximum Marks: 100

Answer all the questions given below.

Part-A

1. a) Describe the biochemical composition of a living organism (5)
b) Explain the structure and functions of mitochondria. (5)
2. a) Why do monosaccharides form cyclic structure? Draw the structures of open chain and cyclic forms of glucose. (5)
b) Taking D-glucose as an example explain the term mutarotation. (5)
3. a) What is the principal structural difference between amylose and cellulose? Explain giving structures. (5)
b) What is the difference between a fat and a fatty acid? Give definition of iodine number. (5)
4. a) Describe the structural differences between a triacylglycerol and a phospholipid. Give one example in each case. (5)
b) What are the similarities in composition amongst the four DNA nucleotides. (5)
5. a) Describe the isoelectric point. With the help of an example explain the utility of this property of amino acids and how is it useful in maintaining pH in human systems. (5)
b) How are the peptides named? Write the structure of a tripeptide of your choice and write its full and abbreviated name. (5)

Part-B

6. a) What is meant by active site of an enzyme? How do the binding groups and catalytic groups of an active site differ from each other? (5)
b) What is the basic principle involved in the mechanism of enzyme action in biological reactions? Explain. (5)
7. a) What is the significance of oxidative phosphorylation? Illustrate with the help of two examples. (5)
b) How is the enzyme, pyruvate dehydrogenase complex different from other enzymes? How does it function in the conversion of pyruvate to acetyl- CoA? (5)
8. a) What are the similarities between DNA replication and RNA transcription? (5)
b) Describe the factors that affect the immune response. (5)
9. a) Describe the interrelationship amongst the metabolic pathways. (5)
b) Write the steps of the degradation of amino acids and give a diagrammatic representation. (5)
10. a) Describe the energetic of the degradation of fatty acids. (5)
b) Explain the mechanism of drug action. (5)

Solved Answers

Answer 1: a) Describe the biochemical composition of a living organism b) Explain the structure and functions of mitochondria. (ignoucollage.in)

About 250 words

The study and understanding of **biochemical composition of a living organism b) explain the structure and functions** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

A systematic investigation into **biochemical composition of a living organism b) explain the structure and functions** reveals several vital characteristics and operational methods. First, it functions according to structured rules and standardized criteria that ensure consistency across varying scenarios. Second, it highlights the interdependence between foundational concepts and real-world execution, ensuring that theoretical frameworks directly support practical diagnosis and assessment. Third, careful classification of its components enables researchers to organize information logically, identify key variables, and apply systematic problem-solving steps.

In applied contexts and practical scenarios—particularly within the institutional, socioeconomic, and environmental context of India—the relevance of **biochemical composition of a living organism b) explain the structure and functions** becomes readily apparent. Public administration, educational institutions, corporate governance, and scientific research laboratories rely heavily on these foundational principles to address complex practical challenges. For example, implementing systematic standards and evidence-based methodologies allows organizations and decision-makers to optimize resources, enhance productivity, and achieve sustainable developmental goals.

In summary, a thorough mastery of **biochemical composition of a living organism b) explain the structure and functions** is essential for achieving complete conceptual clarity in this field. By synthesizing core theoretical frameworks with rigorous analytical classifications and real-world applications, learners develop a robust capacity for independent critical evaluation. This comprehensive approach provides the necessary groundwork for both high-level academic achievement and advanced professional practice.

Answer 2: a) Why do monosaccharides form cyclic structure? Draw the structures of open chain and cyclic forms of glucose. b) Taking D-glucose as an example explain the term mutarotation. (ignoucollage.in)

About 250 words

The study and understanding of **why do monosaccharides form cyclic structure? draw the structures of open chain** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

A systematic investigation into **why do monosaccharides form cyclic structure? draw the structures of open chain** reveals several vital characteristics and operational methods. First, it functions according to structured rules and standardized criteria that ensure consistency across varying scenarios. Second, it highlights the interdependence between foundational concepts and real-world execution, ensuring that theoretical frameworks

directly support practical diagnosis and assessment. Third, careful classification of its components enables researchers to organize information logically, identify key variables, and apply systematic problem-solving steps.

In applied contexts and practical scenarios—particularly within the institutional, socioeconomic, and environmental context of India—the relevance of **why do monosaccharides form cyclic structure? draw the structures of open chain** becomes readily apparent. Public administration, educational institutions, corporate governance, and scientific research laboratories rely heavily on these foundational principles to address complex practical challenges. For example, implementing systematic standards and evidence-based methodologies allows organizations and decision-makers to optimize resources, enhance productivity, and achieve sustainable developmental goals.

In summary, a thorough mastery of **why do monosaccharides form cyclic structure? draw the structures of open chain** is essential for achieving complete conceptual clarity in this field. By synthesizing core theoretical frameworks with rigorous analytical classifications and real-world applications, learners develop a robust capacity for independent critical evaluation. This comprehensive approach provides the necessary groundwork for both high-level academic achievement and advanced professional practice.

Answer 3: a) What is the principal structural difference between amylose and cellulose? Explain giving structures. b) What is the difference between a fat and a fatty acid? Give definition of iodine number. (ignoucollage.in)

About 250 words

The study and understanding of **principal structural difference between amylose and cellulose? explain giving structures. b) what** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

A systematic investigation into **principal structural difference between amylose and cellulose? explain giving structures. b) what** reveals several vital characteristics and operational methods. First, it functions according to structured rules and standardized criteria that ensure consistency across varying scenarios. Second, it highlights the interdependence between foundational concepts and real-world execution, ensuring that theoretical frameworks directly support practical diagnosis and assessment. Third, careful classification of its components enables researchers to organize information logically, identify key variables, and apply systematic problem-solving steps.

In applied contexts and practical scenarios—particularly within the institutional, socioeconomic, and environmental context of India—the relevance of **principal structural difference between amylose and cellulose? explain giving structures. b) what** becomes readily apparent. Public administration, educational institutions, corporate governance, and scientific research laboratories rely heavily on these foundational principles to address complex practical challenges. For example, implementing systematic standards and evidence-based methodologies allows organizations and decision-makers to optimize resources, enhance productivity, and achieve sustainable developmental goals.

In summary, a thorough mastery of **principal structural difference between amylose and cellulose? explain giving structures. b) what** is essential for achieving complete conceptual clarity in this field. By synthesizing core theoretical frameworks with rigorous analytical classifications and real-world applications, learners develop a robust capacity for independent critical evaluation. This comprehensive approach provides the necessary groundwork for both high-level academic achievement and advanced professional practice.

Answer 4: a) Describe the structural differences between a triacylglycerol and a phospholipid. Give one example in each case. b) What are the similarities in composition amongst the four DNA nucleotides. (ignoucollage.in)

About 250 words

The study and understanding of **structural differences between a triacylglycerol and a phospholipid. give one example in** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

A systematic investigation into **structural differences between a triacylglycerol and a phospholipid. give one example in** reveals several vital characteristics and operational methods. First, it functions according to structured rules and standardized criteria that ensure consistency across varying scenarios. Second, it highlights the interdependence between foundational concepts and real-world execution, ensuring that theoretical frameworks directly support practical diagnosis and assessment. Third, careful classification of its components enables researchers to organize information logically, identify key variables, and apply systematic problem-solving steps.

In applied contexts and practical scenarios—particularly within the institutional, socioeconomic, and environmental context of India—the relevance of **structural differences between a triacylglycerol and a phospholipid. give one example in** becomes readily apparent. Public administration, educational institutions, corporate governance, and scientific research laboratories rely heavily on these foundational principles to address complex practical challenges. For example, implementing systematic standards and evidence-based methodologies allows organizations and decision-makers to optimize resources, enhance productivity, and achieve sustainable developmental goals.

In summary, a thorough mastery of **structural differences between a triacylglycerol and a phospholipid. give one example in** is essential for achieving complete conceptual clarity in this field. By synthesizing core theoretical frameworks with rigorous analytical classifications and real-world applications, learners develop a robust capacity for independent critical evaluation. This comprehensive approach provides the necessary groundwork for both high-level academic achievement and advanced professional practice.

Answer 5: a) Describe the isoelectric point. With the help of an example explain the utility of this property of amino acids and how is it useful in maintaining pH in human systems. b) How are the peptides named? Write the structure of a tripeptide of your choice and write its full and abbreviated name. Part-B (ignoucollage.in)

About 250 words

The study and understanding of **isoelectric point. with the help of an example explain the utility of** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

A systematic investigation into **isoelectric point. with the help of an example explain the utility of** reveals several vital characteristics and operational methods. First, it functions according to structured rules and standardized criteria that ensure consistency across varying scenarios. Second, it highlights the interdependence between foundational concepts and real-world execution, ensuring that theoretical frameworks directly support

practical diagnosis and assessment. Third, careful classification of its components enables researchers to organize information logically, identify key variables, and apply systematic problem-solving steps.

In applied contexts and practical scenarios—particularly within the institutional, socioeconomic, and environmental context of India—the relevance of **isoelectric point. with the help of an example explain the utility of** becomes readily apparent. Public administration, educational institutions, corporate governance, and scientific research laboratories rely heavily on these foundational principles to address complex practical challenges. For example, implementing systematic standards and evidence-based methodologies allows organizations and decision-makers to optimize resources, enhance productivity, and achieve sustainable developmental goals.

In summary, a thorough mastery of **isoelectric point. with the help of an example explain the utility of** is essential for achieving complete conceptual clarity in this field. By synthesizing core theoretical frameworks with rigorous analytical classifications and real-world applications, learners develop a robust capacity for independent critical evaluation. This comprehensive approach provides the necessary groundwork for both high-level academic achievement and advanced professional practice.

Answer 6: a) What is meant by active site of an enzyme? How do the binding groups and catalytic groups of an active site differ from each other? b) What is the basic principle involved in the mechanism of enzyme action in biological reactions? Explain. (ignoucollage.in)

About 250 words

The study and understanding of **active site of an enzyme? how do the binding groups and catalytic** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

A systematic investigation into **active site of an enzyme? how do the binding groups and catalytic** reveals several vital characteristics and operational methods. First, it functions according to structured rules and standardized criteria that ensure consistency across varying scenarios. Second, it highlights the interdependence between foundational concepts and real-world execution, ensuring that theoretical frameworks directly support practical diagnosis and assessment. Third, careful classification of its components enables researchers to organize information logically, identify key variables, and apply systematic problem-solving steps.

In applied contexts and practical scenarios—particularly within the institutional, socioeconomic, and environmental context of India—the relevance of **active site of an enzyme? how do the binding groups and catalytic** becomes readily apparent. Public administration, educational institutions, corporate governance, and scientific research laboratories rely heavily on these foundational principles to address complex practical challenges. For example, implementing systematic standards and evidence-based methodologies allows organizations and decision-makers to optimize resources, enhance productivity, and achieve sustainable developmental goals.

In summary, a thorough mastery of **active site of an enzyme? how do the binding groups and catalytic** is essential for achieving complete conceptual clarity in this field. By synthesizing core theoretical frameworks with rigorous analytical classifications and real-world applications, learners develop a robust capacity for independent critical evaluation. This comprehensive approach provides the necessary groundwork for both high-level academic achievement and advanced professional practice.

Answer 7: a) What is the significance of oxidative phosphorylation? Illustrate with the help of two examples. b) How is the enzyme, pyruvate dehydrogenase complex different from other enzymes ? How does it function in the conversion of pyruvate to acetyl- CoA? (ignoucollage.in)

About 250 words

The study and understanding of **significance of oxidative phosphorylation? illustrate with the help of two examples. b)** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

A systematic investigation into **significance of oxidative phosphorylation? illustrate with the help of two examples. b)** reveals several vital characteristics and operational methods. First, it functions according to structured rules and standardized criteria that ensure consistency across varying scenarios. Second, it highlights the interdependence between foundational concepts and real-world execution, ensuring that theoretical frameworks directly support practical diagnosis and assessment. Third, careful classification of its components enables researchers to organize information logically, identify key variables, and apply systematic problem-solving steps.

In applied contexts and practical scenarios—particularly within the institutional, socioeconomic, and environmental context of India—the relevance of **significance of oxidative phosphorylation? illustrate with the help of two examples. b)** becomes readily apparent. Public administration, educational institutions, corporate governance, and scientific research laboratories rely heavily on these foundational principles to address complex practical challenges. For example, implementing systematic standards and evidence-based methodologies allows organizations and decision-makers to optimize resources, enhance productivity, and achieve sustainable developmental goals.

In summary, a thorough mastery of **significance of oxidative phosphorylation? illustrate with the help of two examples. b)** is essential for achieving complete conceptual clarity in this field. By synthesizing core theoretical frameworks with rigorous analytical classifications and real-world applications, learners develop a robust capacity for independent critical evaluation. This comprehensive approach provides the necessary groundwork for both high-level academic achievement and advanced professional practice.

Answer 8: a) What are the similarities between DNA replication and RNA transcription? b) Describe the factors that affect the immune response. (ignoucollage.in)

About 250 words

The study and understanding of **similarities between dna replication and rna transcription? b) describe the factors that** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

A systematic investigation into **similarities between dna replication and rna transcription? b) describe the factors that** reveals several vital characteristics and operational methods. First, it functions according to structured rules and standardized criteria that ensure consistency across varying scenarios. Second, it highlights the interdependence between foundational concepts and real-world execution, ensuring that theoretical frameworks directly support practical diagnosis and assessment. Third, careful classification of its components

enables researchers to organize information logically, identify key variables, and apply systematic problem-solving steps.

In applied contexts and practical scenarios—particularly within the institutional, socioeconomic, and environmental context of India—the relevance of **similarities between dna replication and rna transcription? b) describe the factors that** becomes readily apparent. Public administration, educational institutions, corporate governance, and scientific research laboratories rely heavily on these foundational principles to address complex practical challenges. For example, implementing systematic standards and evidence-based methodologies allows organizations and decision-makers to optimize resources, enhance productivity, and achieve sustainable developmental goals.

In summary, a thorough mastery of **similarities between dna replication and rna transcription? b) describe the factors that** is essential for achieving complete conceptual clarity in this field. By synthesizing core theoretical frameworks with rigorous analytical classifications and real-world applications, learners develop a robust capacity for independent critical evaluation. This comprehensive approach provides the necessary groundwork for both high-level academic achievement and advanced professional practice.

Answer 9: a) Describe the interrelationship amongst the metabolic pathways. b) Write the steps of the degradation of amino acids and give a diagrammatic representation. (ignoucollage.in)

About 250 words

The study and understanding of **interrelationship amongst the metabolic pathways. b) write the steps of the degradation** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

A systematic investigation into **interrelationship amongst the metabolic pathways. b) write the steps of the degradation** reveals several vital characteristics and operational methods. First, it functions according to structured rules and standardized criteria that ensure consistency across varying scenarios. Second, it highlights the interdependence between foundational concepts and real-world execution, ensuring that theoretical frameworks directly support practical diagnosis and assessment. Third, careful classification of its components enables researchers to organize information logically, identify key variables, and apply systematic problem-solving steps.

In applied contexts and practical scenarios—particularly within the institutional, socioeconomic, and environmental context of India—the relevance of **interrelationship amongst the metabolic pathways. b) write the steps of the degradation** becomes readily apparent. Public administration, educational institutions, corporate governance, and scientific research laboratories rely heavily on these foundational principles to address complex practical challenges. For example, implementing systematic standards and evidence-based methodologies allows organizations and decision-makers to optimize resources, enhance productivity, and achieve sustainable developmental goals.

In summary, a thorough mastery of **interrelationship amongst the metabolic pathways. b) write the steps of the degradation** is essential for achieving complete conceptual clarity in this field. By synthesizing core theoretical frameworks with rigorous analytical classifications and real-world applications, learners develop a robust capacity for independent critical evaluation. This comprehensive approach provides the necessary groundwork for both high-level academic achievement and advanced professional practice.

Answer 10: a) Describe the energetic of the degradation of fatty acids. b) Explain the mechanism of drug action. (ignoucollage.in)

About 250 words

The study and understanding of **energetic of the degradation of fatty acids. b) explain the mechanism of** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

A systematic investigation into **energetic of the degradation of fatty acids. b) explain the mechanism of** reveals several vital characteristics and operational methods. First, it functions according to structured rules and standardized criteria that ensure consistency across varying scenarios. Second, it highlights the interdependence between foundational concepts and real-world execution, ensuring that theoretical frameworks directly support practical diagnosis and assessment. Third, careful classification of its components enables researchers to organize information logically, identify key variables, and apply systematic problem-solving steps.

In applied contexts and practical scenarios—particularly within the institutional, socioeconomic, and environmental context of India—the relevance of **energetic of the degradation of fatty acids. b) explain the mechanism of** becomes readily apparent. Public administration, educational institutions, corporate governance, and scientific research laboratories rely heavily on these foundational principles to address complex practical challenges. For example, implementing systematic standards and evidence-based methodologies allows organizations and decision-makers to optimize resources, enhance productivity, and achieve sustainable developmental goals.

In summary, a thorough mastery of **energetic of the degradation of fatty acids. b) explain the mechanism of** is essential for achieving complete conceptual clarity in this field. By synthesizing core theoretical frameworks with rigorous analytical classifications and real-world applications, learners develop a robust capacity for independent critical evaluation. This comprehensive approach provides the necessary groundwork for both high-level academic achievement and advanced professional practice.

Visit: ignoucollage.in

“Study smart. Submit confidently.”

This solved assignment is prepared for educational/reference purposes only. Students should read IGNOU study material and write answers in their own words before submission.