

Bachelor of Pharmacy

Assignment

3rd Semester

Session 2024-2025



Mahatma Gandhi University

Daramdin , Sikkim

Email :- mgusikkim@gmail.com

Website : www.mgusikkim.com

Submission Guidelines:

- **Deadline:** 10-Dec-2024
- **Format:** Handwritten, cleanly presented, and stapled in order.
- **Assessment Criteria:** Clarity, accuracy, and detail in explanations will be evaluated. Diagrams, where required, should be neatly labeled.

Tips for Completion:

1. Review lecture notes and textbooks for accurate answers.
2. For short and long questions, incorporate labeled diagrams where applicable.
3. Ensure answers in each section are within the word limits to demonstrate concise understanding.

You will find it useful to keep the following points in mind:

a) **Planning:** Read the assignment carefully. Go through the units on which they are based. Make some points regarding each question and then re-arrange these in a logical order in your own words.

b) **Organisation:** Be a little more selective and analytical before drawing up a rough outline of your answer. In an essay-type question, give adequate attention to your introduction and conclusion. The introduction must offer your brief interpretation of the question and how you propose to develop it. The conclusion must summarise your response to the question.

Make sure that your answer:

- is logical and coherent;
- has clear connections between sentences and paragraphs;
- is written correctly giving adequate consideration to your expression, style and presentation;
- does not exceed the number of words indicated in your question.

a) **Presentation:** Once you are satisfied with your answers, you can write down the final version for submission, writing each answer neatly and underlining the points you wish to emphasise.

b) **Interpretation:** Interpretation is a constant process in history writing. It is already reflected in your planning and selection. Explanatory comments with phrases like may be, because, could be, etc., immediately introduce an element of interpretation in writing itself. Here you have to be careful that these comments can be supported by the material you have in the answer.

Submit your assignment at MGU , Sikkim Campus Address

Assignment: Pharmaceutical Organic Chemistry II

Course: B.Pharm, 3rd Semester

Total Marks: 100

Instructions: Answer all questions in each section as specified. Use diagrams and reaction mechanisms where applicable and label them clearly.

Section A: Very Short Answer Questions (2 marks each)

Answer any 10 questions. Each question carries 2 marks.

[Total Marks: 20]

1. Define optical isomerism.
 2. What is Markovnikov's rule?
 3. Write the general formula for alkynes.
 4. Define resonance with an example.
 5. Name the reagent used for the oxidation of primary alcohols to aldehydes.
 6. What is an electrophile?
 7. Explain the term "carbocation."
 8. Write the IUPAC name of $\text{CH}_3\text{-CH}_2\text{-COOH}$.
 9. Define aromaticity with an example.
 10. Name one method of preparation of ethers.
 11. What is a free radical?
 12. Write the structure of benzyl chloride.
 13. Define nucleophilic substitution reaction.
-

Section B: Short Answer Questions (5 marks each)

Answer any 8 questions. Each question carries 5 marks.

[Total Marks: 40]

1. Explain the concept of hyperconjugation with an example.
 2. Write the mechanism of electrophilic aromatic substitution reactions.
 3. Describe the Hoffmann rearrangement with its mechanism.
 4. Differentiate between $\text{S}_{\text{N}}1$ and $\text{S}_{\text{N}}2$ reactions.
 5. Explain the process of free radical halogenation of alkanes.
 6. Discuss the stability of carbocations and their order.
 7. Write a note on the acidic nature of phenols and explain why phenol is more acidic than ethanol.
 8. Describe the structure and hybridization of benzene.
 9. Explain the oxidation of alcohols to aldehydes and ketones.
 10. Illustrate with examples the concept of stereoisomerism.
-

Section C: Long Answer Questions (10 marks each)

Answer any 4 questions. Each question carries 10 marks.

[Total Marks: 40]

1. Explain the mechanism of the Aldol condensation reaction, and provide examples for both aldol and mixed aldol condensation.
2. Discuss the types of isomerism in organic compounds, giving suitable examples for each type.
3. Describe the synthesis, properties, and uses of phenols. Include the methods of preparation and chemical reactions.
4. Explain the Perkin reaction and Cannizzaro reaction, including their mechanisms and applications in organic synthesis.
5. Discuss the mechanisms of nucleophilic addition reactions in aldehydes and ketones. Provide examples of nucleophiles involved in these reactions.
6. Describe the concept of aromatic substitution reactions, covering both the activating and deactivating groups and their effects on substitution patterns in benzene.

Assignment: Physical Pharmaceutics I

Course: B.Pharm, 3rd Semester

Total Marks: 100

Instructions: Answer all questions in each section as specified. Include diagrams, calculations, and examples where appropriate. Show all steps for calculations clearly.

Section A: Very Short Answer Questions (2 marks each)

Answer any 10 questions. Each question carries 2 marks.

[Total Marks: 20]

1. Define solubility.
 2. What is surface tension?
 3. Explain the term "partition coefficient."
 4. Write the Henderson-Hasselbalch equation.
 5. Define the term "buffer capacity."
 6. What is osmosis?
 7. Give two examples of colligative properties.
 8. State Raoult's law.
 9. Define polymorphism.
 10. What is viscosity?
 11. Describe Brownian movement.
 12. Define isotonic solution.
 13. What is a suspension in pharmaceuticals?
-

Section B: Short Answer Questions (5 marks each)

Answer any 8 questions. Each question carries 5 marks.

[Total Marks: 40]

1. Explain the factors affecting solubility.
 2. Describe the types of emulsions and their pharmaceutical applications.
 3. Discuss the role of surfactants in pharmaceuticals and provide examples.
 4. Explain the difference between adsorption and absorption.
 5. Describe the methods to determine particle size in pharmaceutical preparations.
 6. What is the importance of pH in drug solubility and stability?
 7. Write a note on interfacial phenomena and its significance in pharmaceuticals.
 8. Explain how temperature affects viscosity and provide examples.
 9. Discuss the concept of rheology and its relevance in formulation development.
 10. Describe the techniques used to measure surface tension in liquid formulations.
-

Section C: Long Answer Questions (10 marks each)

Answer any 4 questions. Each question carries 10 marks.

[Total Marks: 40]

1. Explain the theory and applications of dissolution and diffusional studies in pharmaceuticals. Provide examples of how these concepts impact drug formulation and release.
2. Discuss in detail the preparation, stability, and evaluation of colloidal dispersions. Include the types of colloids and their pharmaceutical importance.
3. Describe in-depth the process of buffer preparation and its applications in pharmaceutical formulations. Explain factors affecting buffer capacity with examples.
4. Explain the significance of particle size distribution in pharmaceuticals. Discuss its influence on drug absorption, solubility, and bioavailability.
5. Describe the principles of thermodynamics in pharmaceuticals, with a focus on the first and second laws. Provide examples of how these principles are applied in drug formulation.
6. Discuss the concept of flow properties (Newtonian and non-Newtonian) and their measurement in pharmaceutical suspensions and emulsions.

Assignment: Pharmaceutical Microbiology

Course: B.Pharm, 3rd Semester

Total Marks: 100

Instructions: Answer all questions in each section as specified. Provide labeled diagrams, examples, and explanations where appropriate.

Section A: Very Short Answer Questions (2 marks each)

Answer any 10 questions. Each question carries 2 marks.

[Total Marks: 20]

1. Define sterilization.
 2. What is the difference between bactericidal and bacteriostatic agents?
 3. Name two methods for measuring microbial growth.
 4. Define aseptic technique.
 5. What is a nosocomial infection?
 6. Mention two differences between bacteria and viruses.
 7. What is the role of an autoclave in microbiology?
 8. Define gram-positive and gram-negative bacteria.
 9. What are antibiotics?
 10. Explain the term "pathogen."
 11. Name two types of culture media used in microbiology.
 12. What is the importance of a HEPA filter?
 13. Define contamination in the context of microbiology.
-

Section B: Short Answer Questions (5 marks each)

Answer any 8 questions. Each question carries 5 marks.

[Total Marks: 40]

1. Describe the structure and function of bacterial cell walls.
 2. Explain the process of gram staining and its significance in microbiology.
 3. Discuss the different types of sterilization methods used in pharmaceuticals.
 4. Explain the role of probiotics and their pharmaceutical applications.
 5. Describe the mechanism of action of any two classes of antibiotics.
 6. Explain the importance of culture media and the classification of media based on function.
 7. Write a note on microbial growth phases.
 8. Describe the methods for assessing microbial contamination in pharmaceutical products.
 9. Explain the significance of the Minimum Inhibitory Concentration (MIC) in microbiology.
 10. Discuss the factors affecting microbial growth in pharmaceutical environments.
-

Section C: Long Answer Questions (10 marks each)

Answer any 4 questions. Each question carries 10 marks.

[Total Marks: 40]

1. Describe in detail the methods of sterilization used in pharmaceutical microbiology, including physical, chemical, and radiation methods. Discuss the advantages and limitations of each method.
2. Explain the microbial assay of antibiotics, including the methods used and their importance in determining antibiotic potency and effectiveness.
3. Discuss the sources and types of microbial contamination in pharmaceuticals and outline the procedures used to control contamination in manufacturing environments.
4. Describe the immune response mechanisms of the human body against microbial infections. Discuss the role of antibodies, antigens, and vaccines.
5. Explain the process of microbial spoilage in pharmaceutical products and the preventive measures used in manufacturing to avoid it.
6. Describe the applications of microbiology in the development of vaccines, including the processes involved in vaccine formulation and quality control.

Assignment: Pharmaceutical Engineering

Course: B.Pharm, 3rd Semester

Total Marks: 100

Instructions: Answer all questions in each section as specified. Provide labeled diagrams, examples, and detailed explanations where appropriate.

Section A: Very Short Answer Questions (2 marks each)

Answer any 10 questions. Each question carries 2 marks.

[Total Marks: 20]

1. Define pharmaceutical engineering.
 2. What is the significance of the heat transfer process in pharmaceutical engineering?
 3. Explain the term "fluid flow" in pharmaceutical engineering.
 4. Define the term "centrifugation."
 5. What is the function of a tablet press in pharmaceutical manufacturing?
 6. What is meant by the term "drying" in the context of pharmaceuticals?
 7. What is the difference between laminar and turbulent flow?
 8. Mention any two types of filtration methods used in pharmaceutical engineering.
 9. Define "mixing" and its importance in pharmaceutical processes.
 10. What is the significance of sterilization in pharmaceutical manufacturing?
 11. Define "batch processing" in pharmaceutical engineering.
 12. What are the components of a typical pharmaceutical plant?
 13. What is the function of a vacuum dryer?
-

Section B: Short Answer Questions (5 marks each)

Answer any 8 questions. Each question carries 5 marks.

[Total Marks: 40]

1. Explain the concept of mass transfer and its importance in pharmaceutical processes.
 2. Discuss the principles and applications of distillation in pharmaceutical manufacturing.
 3. Explain the working principle of a tablet compression machine.
 4. Describe the different types of heat exchangers used in pharmaceutical processes.
 5. Discuss the factors affecting the rate of filtration in pharmaceutical processes.
 6. Explain the role of quality control in pharmaceutical engineering.
 7. Write a note on the design and operation of a pharmaceutical fluidized bed dryer.
 8. What is the role of mixers in pharmaceutical manufacturing? Discuss different types of mixers.
 9. Explain the importance of particle size distribution in pharmaceutical processes.
 10. Describe the principles of refrigeration and its applications in pharmaceutical engineering.
-

Section C: Long Answer Questions (10 marks each)

Answer any 4 questions. Each question carries 10 marks.

[Total Marks: 40]

1. Discuss in detail the different types of equipment used for the manufacturing of tablets. Explain their functions and the considerations for their selection and maintenance.
 2. Explain the principles of heat transfer and its application in pharmaceutical manufacturing processes. Discuss the methods of heat transfer (conduction, convection, and radiation) and their role in equipment design.
 3. Describe the different types of fluid flow regimes encountered in pharmaceutical engineering. Discuss their significance in equipment design and manufacturing processes, with examples.
 4. Discuss the different types of dryers used in pharmaceutical manufacturing, including tray dryers, fluidized bed dryers, and spray dryers. Explain their working principles, advantages, and limitations.
 5. Explain the importance of filtration in pharmaceutical processes. Discuss the different types of filtration techniques (e.g., membrane filtration, pressure filtration) used in the industry.
 6. Discuss the principles of scaling up from laboratory to industrial scale in pharmaceutical manufacturing. What challenges are faced during the scale-up process, and how can they be overcome?
-