



Faculty of Health Sciences
Bachelor of Science Honours in Industrial Pharmaceutical Science
Bachelor of Science Honours in Cosmetic Sciences
IPS 3124 - Pharmaceutical Engineering - I
BCS 3143 - Cosmetic Technology - I
Batch - 07
3rd year 1st semester
End Semester SEQ Examination

Date: 11th February 2026

Time: 09.00 a.m. – 12.00 noon (Three hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.

Question 01

(100 marks)

- 1.1 List **three (03)** types of sedimentation centrifuges. (15 marks)
- 1.2 An industrial centrifuge is designed to withstand a maximum centripetal force of 500 N.
A sample of mass 52 g is placed at a radial distance of 28 cm from the axis of rotation.
Calculate the maximum angular velocity (in rad/s) at which the centrifuge can be safely operated. (20 marks)
- 1.3 Describe the construction and working of perforated bowl centrifuge. (30 marks)
- 1.4 Outline the different mechanisms employed in filtration. (35 marks)

Question 02

(100 marks)

- 2.1 Relate the key maintenance activities to be carried out on pumps and their compliance relevance. (20 marks)
- 2.2 Outline the construction & working of pneumatic conveyor. (20 marks)
- 2.3 Compare the air / gas handling equipment used in pharmaceutical and cosmeceutical industry. (30 marks)
- 2.4 Discuss the applications of pumps in formulation and production of pharmaceutical & cosmetic products. (30 marks)

Question 03

(100 marks)

- 3.1 List **four (04)** filter aids used in industrial filtration. (20 marks)
- 3.2 Write an equation for the Poiseuille's law of capillary flow and define all terms. (20 marks)
- 3.3 Classify industrial scale filters. (20 marks)
- 3.4 Relate the construction of high efficiency particulate air (HEPA) filter to its action. (20 marks)

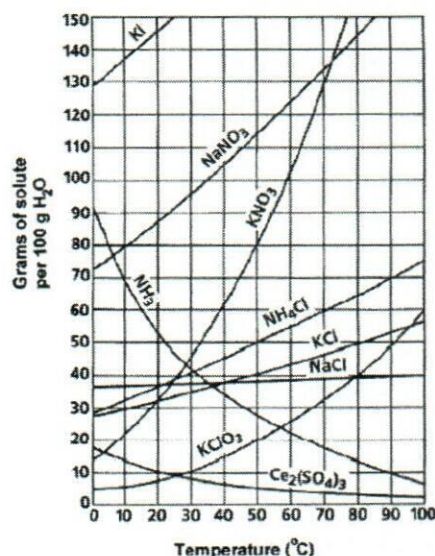
- 3.5 A suspension in a pipeline experiences a shear stress of 3.0 Pa when a shear rate 100 s^{-1} is applied. Calculate the dynamic viscosity and kinematic viscosity of the suspension. (20 marks)

Question 04**(100 marks)**

- 4.1 Define the term 'non-Newtonian fluids'. (15 marks)
- 4.2 A pharmaceutical company is designing a pipeline system to transport a solution from a storage tank to a filling station. Determine whether the following flow regime is suitable to ensure the laminar flow during the active process: density = 1000 kg/m^3 , dynamic viscosity = 0.002 Pa.s , flow velocity = 0.10 m/s , pipeline diameter = 0.05 m . (25 marks)
- 4.3 Outline the importance of Bernoulli's theorem in industrial applications. (30 marks)
- 4.4 Briefly describe the working principle of Venturi meter using a simple labelled diagram. (30 marks)

Question 05**(100 marks)**

- 5.1 Analyze the importance of solvent selection in crystallization process. (20 marks)
- 5.2 Suggest **five (05)** measures to avoid precipitation during crystallization process. (20 marks)
- 5.3 Discuss **three (03)** factors that influence caking of crystals. (30 marks)
- 5.4 Answer the following questions based on the given solubility chart.

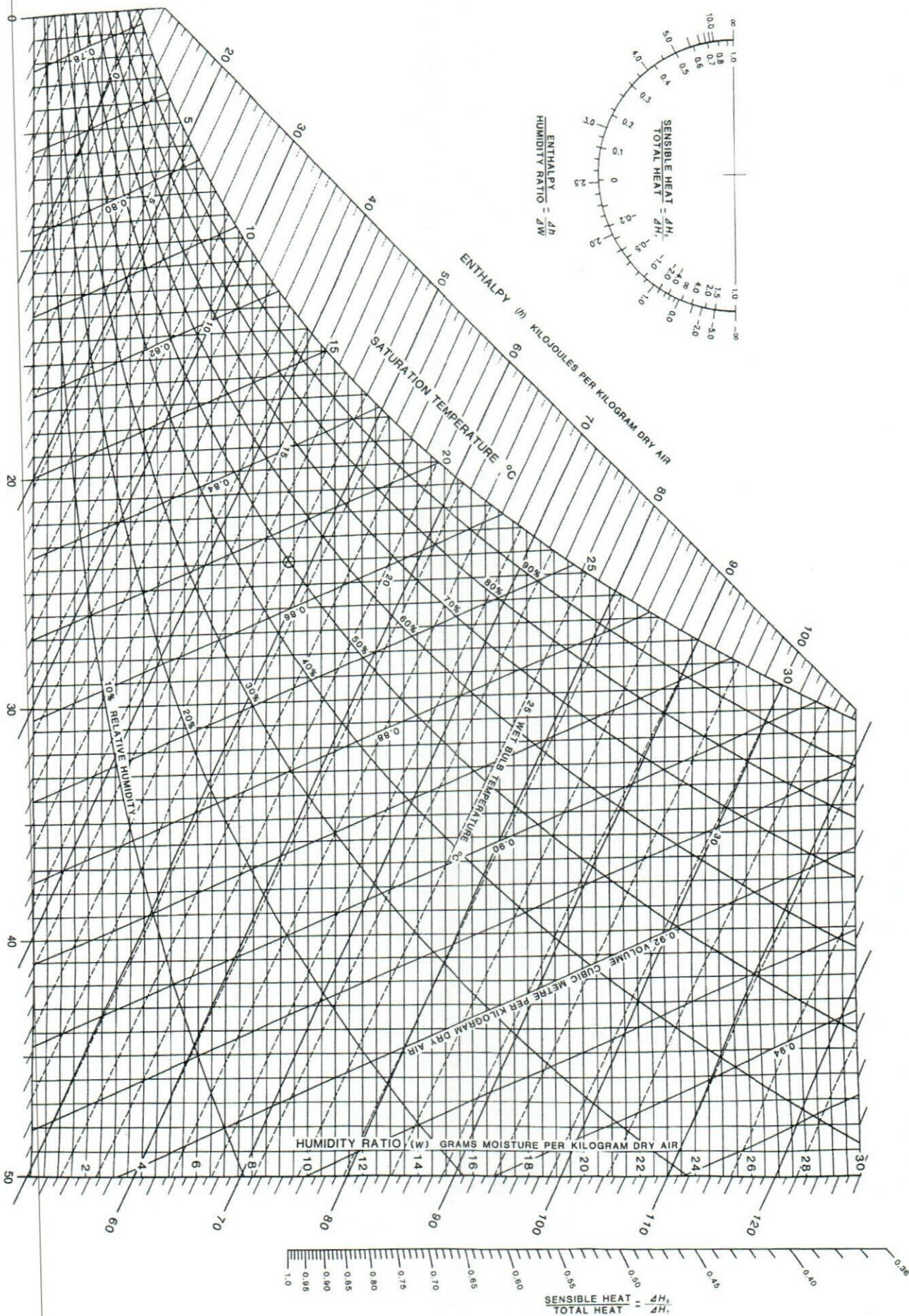


- 5.4.1 Determine the substances which has the same solubility at 78°C . (10 marks)
- 5.4.2 Calculate the grams of potassium chloride that would be in 200 g of water at 80°C if it is a saturated solution? (20 marks)

Question 06**(100 marks)**

- 6.1 Classify pharmaceutical or cosmetic raw materials based on their moisture absorbing tendency. (20 marks)
- 6.2 Illustrate adiabatic saturation using suitable flow diagram. (25 marks)
- 6.3 Moisture to dry air mixing ratio and a relative humidity of a sample of moist air are 10.5 g/kg and 50% respectively. Compute the following using the given psychrometric chart as required.
- 6.3.1 Saturation mixing ratio (15 marks)
- 6.3.2 Dry-bulb temperature (20 marks)
- 6.3.3 Dew point temperature (20 marks)

DRY BULB TEMPERATURE °C



Faculty of Health Sciences
Bachelor of Science Honors in Industrial Pharmaceutical Science
IPS 3124 Pharmaceutical Engineering I
Batch 04
3rd Year 1st Semester
End Semester (Special Resit) Examination – Mid Assignment

INDEX NUMBER:

Date : 07th of July 2025

Time : 1.30 p.m. – 2.30 p.m. (One hour)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **Two** questions.
- Answer **ALL** the questions.
- Final answers should be given legibly in black or blue ink.

Question 01

(100 marks)

1.1 Classify gas handling systems.

(40 marks)

1.2 Draw a diagram of a centrifugal pump and describe its mechanism of action.

(60 marks)

Questions 02

(100 marks)

2.1 Briefly describe the importance of humidity control in the pharmaceutical industry.

(50 marks)

2.2 Describe the construction of an industrial reverse osmosis plant by using a diagram.

(50 marks)

Faculty of Health Sciences
Bachelor of Science Honors in Industrial Pharmaceutical Science
IPS 3124 Pharmaceutical Engineering I
Batch 04
3rd Year 1st Semester
End Semester (Special Resit) Examination - SEQ

INDEX NUMBER:

Date : 07th of July 2025

Time : 9.00 a.m. - 12.00 noon (Three hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** questions.
- Answer **ALL** the questions on this paper itself.
- Final answers should be given legibly in black or blue ink.

Question 01

(100 marks)

1.1 Write **two (02)** applications of fluids flow in the pharmaceutical industry.

(30 marks)

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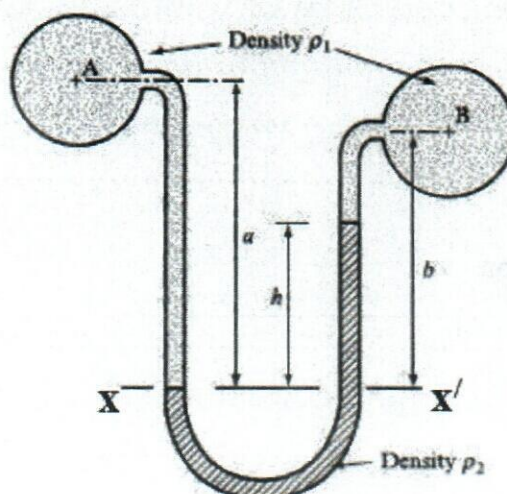
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1.2 A U-tube manometer measures the pressure difference between two points A and B in a liquid with density ρ_1 . The U-tube contains mercury with density ρ_2 .



1.2.1 Write an equation for P_{xx} considering left hand side limb.

(20 marks)

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1.2.2. Write an equation for P_{xx} considering right hand side limb.

(20 marks)

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1.2.3. Calculate the difference of pressure if $a = 1.5$ m, $b = 0.5$ m and $h = 0.75$ m if the liquid at A and B is water ($\rho_1 = 1000$ kg/m³) and $\rho_2 = 13.6 \rho_1$. (30 marks)

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Question 02

(100 marks)

2.1. State the working principle behind a venture meter.

(25 marks)

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2.2 State the Bernoulli's equation.

(20 marks)

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2.3 Water enters to a horizontal pipe of non-uniform cross-section with a velocity of 0.5 m/s and leaves from the other end with a velocity of 0.1 m/s. At the first end, pressure of water is 1500 N/m². Calculate the pressure of water at the other end. (Density of water = 1000 kg/m³) (25 marks)

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2.4 What is the use of pressure relief valves in the pharmaceutical industry? (30 marks)

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Question 03

(100 marks)

3.1 Write **five (05)** factors influencing the filtration rate.

(20 marks)

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3.2 State **four (04)** characteristics of filter aids.

(20 marks)

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3.3 What is a filter media?

(20 marks)

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3.4 State **four (04)** reasons for not using asbestos pads frequently as a filter media.

(20 marks)

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3.5 What is the purpose of using membrane filters to prepare sterile solution?

(20 marks)

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Question 04

(100 marks)

4.1 What is a material handling system?

(20 marks)

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4.2 State **four (04)** types of solid handling systems.

(20 marks)

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4.3 Mention **three (03)** reasons to use pneumatic conveying systems rather than the other alternatives. (30 marks)

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4.4. Write a short note on the mechanism of action of a piston pump. (30 marks)

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Question 05 (100 marks)

5.1 State **three (03)** humidity measurement methods. (15 marks)

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5.2 Inside the manufacturing facility of the pharmaceutical plant recommended RH range is 40% - 60%. The following table shows the wet bulb and dry bulb readings at two different stages.

1.

Dry bulb reading	54 °F
Wet bulb reading	63 °F

2.

Dry bulb reading	70 °F
Wet bulb reading	68°F

5.2.1. Find relative humidity values from the psychrometric chart related to the above two stages. (20 marks)

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5.2.2. Comment on the above two stages separately concerning the ability to run a production process.

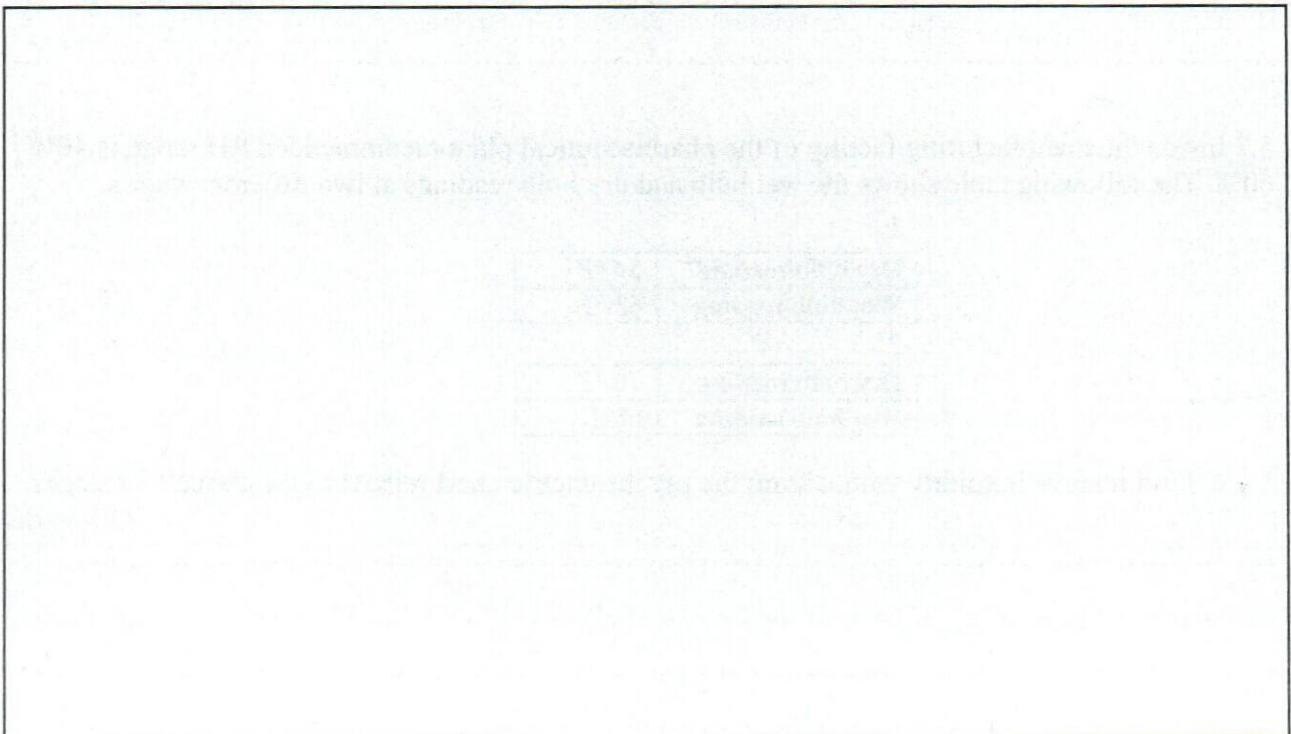
(20 marks)

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5.2.3 If there is an issue in environmental conditions at one of the above stages, what is the decision you can make as the production executive to carry out the production process correctly?

(20 marks)

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5.3. Illustrate the mechanism of action of the HVAC unit by using a diagram.

(25 marks)



Question 06**(100 marks)**6.1 State **three (03)** types of rotors available in basic centrifuge machines.**(15 marks)**

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6.2 State the types of sedimentation centrifuges.

(15 marks)

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6.3 What is crystal caking?

(30 marks)

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6.4 State how a continuous crystallizer is different from a batch crystallizer.

(40 marks)

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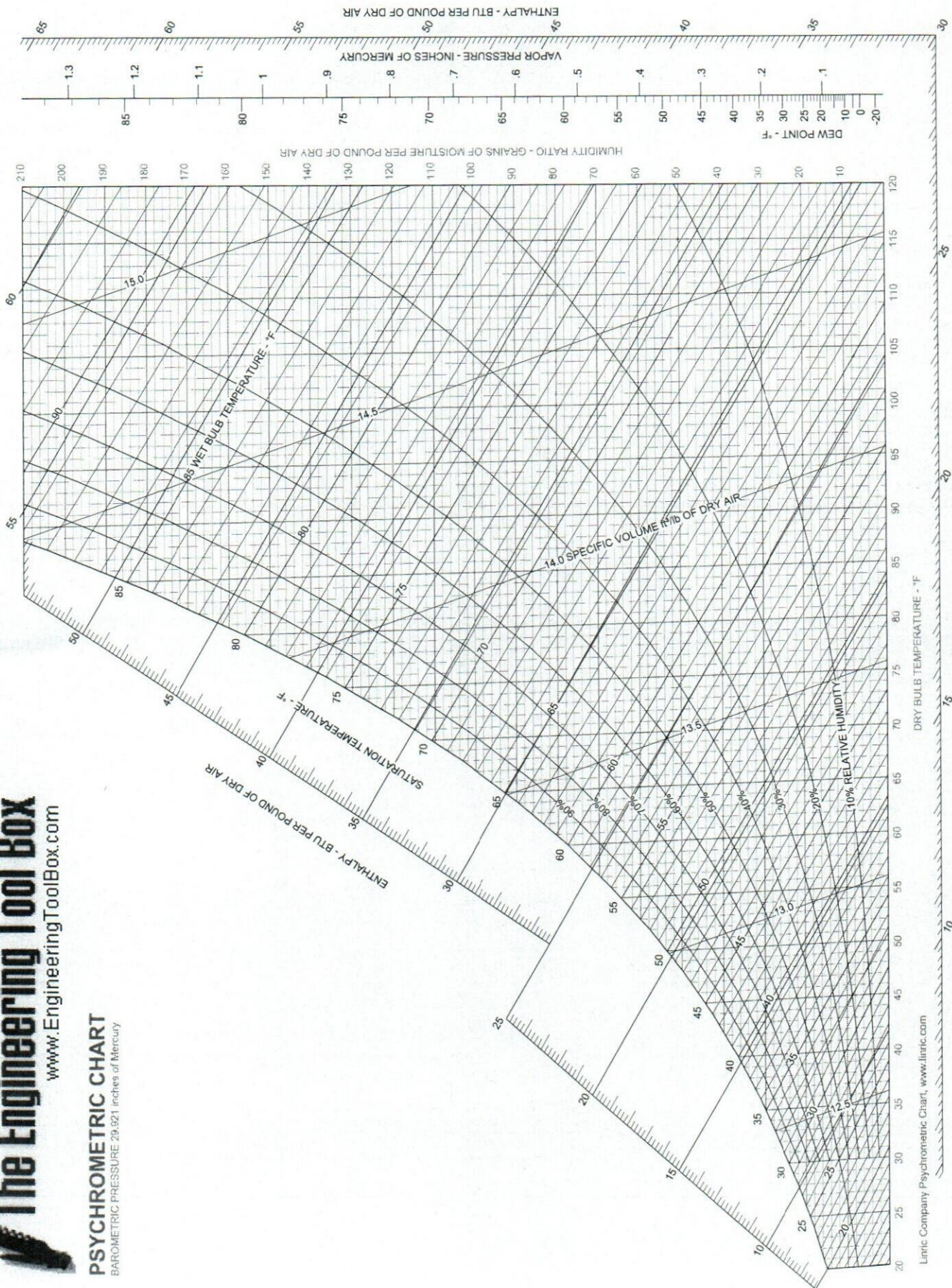
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PSYCHROMETRIC CHART
BAROMETRIC PRESSURE 29.921 inches of Mercury



Faculty of Health Sciences
Bachelor of Science Honors in Industrial Pharmaceutical Science
IPS 3143 Industrial Pharmaceutics II

Batch 04
3rd Year 1st Semester
End Semester (Special Resit) Examination - SEQ

INDEX NUMBER:

Date : 03rd of July 2025

Time : 9.00 a.m. – 12.00 noon (Three hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** questions.
- Answer **ALL** the questions on this paper itself.
- Final answers should be given legibly in black or blue ink.

Question 01

(100 marks)

1.1 List different types of liquid dosage forms.

(30 marks)

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1.2 State the advantages of liquid dosage forms compared to solid dosage forms.

(30 marks)

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1.3 Write a short note on non-aqueous solution dosage forms.

(40 marks)

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Question 02**(100 marks)**

2.1 State the significance of hardness and friability tests in tablet quality control. (30 marks)

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2.2 What are good manufacturing practices (GMP) in the pharmaceutical industry? (30 marks)

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2.3 How the size of the suspended particles will affect the formulated suspension? (40 marks)

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Question 03**(100 marks)**

3.1 State **five (05)** ideal properties of a pharmaceutical suspension. (30 marks)

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3.2 State the function of electrolytes as a flocculating agent.

(30 marks)

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3.3 What are the possible instability mechanisms of pharmaceutical emulsions?

(40 marks)

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Question 04

(100 marks)

4.1 Classify different types of aerosol delivery systems.

(30 marks)

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4.2 List components of total parenteral nutrition.

(30 marks)

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4.3 Write a short note on parenteral dosage forms.

(40 marks)

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Question 05**(100 marks)**

5.1 State different methods of sterility testing for injectable pharmaceuticals.

(30 marks)

5.2 What is rabbit pyrogen test for sterile medicines?

(30 marks)

5.3 What are the different factors that should be considered when selecting materials for fabrication of pharmaceutical machineries.

(40 marks)**Question 06****(100 marks)**

6.1 What is the importance of proper packaging of medicines?

(30 marks)

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6.2 List **five (05)** types of packaging materials used in pharmaceutical industry. (30 marks)

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6.3 Outline different semisolid dosage forms. (40 marks)

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Faculty of Health Sciences
Bachelor of Science Honors in Industrial Pharmaceutical Science
IPS 3133 – Advanced Medicinal Chemistry I

Batch – 04
3rd year 1st semester
End Semester SEQ Examination (Special Resit)

Date : 02nd of July 2025
Time : 09.00 a.m. – 12.00 noon (Three hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.
- You are allowed to use non-programmable calculators.

Question 01

(100 marks)

1.1. State the impact of temperature and pH on the stability of insulin.

(30 marks)

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1.2. Draw the pathways of synthesise propylthiouracil.

(40 marks)

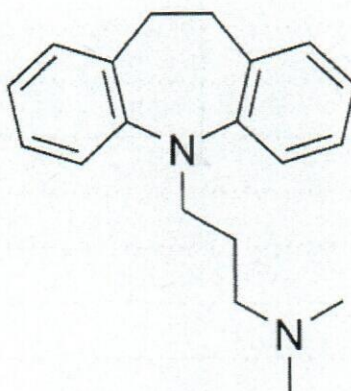
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(30 marks)

[illegible]

(100 marks)

(20 marks)



(30 marks)

2.3. State how therapeutic efficacy enhanced in diflunisal.

(20 marks)

2.4. Heroin is a strong μ agonist developed by altering the morphine structure. Briefly explain this statement. (30 marks)

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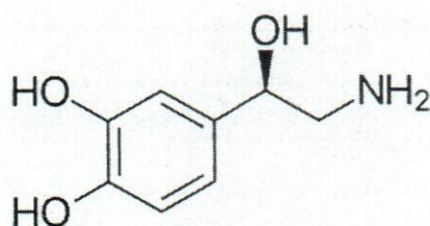
Question 03**(100 marks)**

3.1. State the mechanism of irreversible receptor antagonist.

(20 marks)

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3.2. The structure of the norepinephrine is given below.



3.2.1. Draw the chemical structure of salbutamol by using the given structure.

(20 marks)

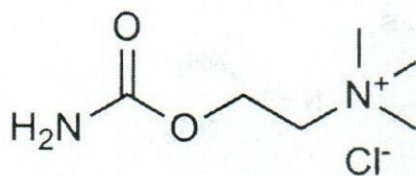
3.2.2. What is the chemical modification in salbutamol to increase the beta 2 selectivity?

(20 marks)

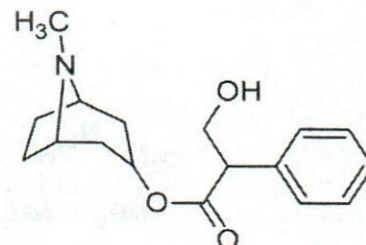
3.3. Identify the chemical structures given below.

(40 marks)

3.3.1.



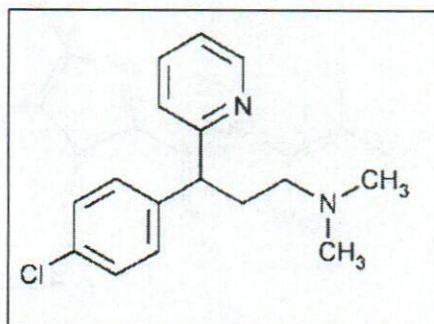
3.3.2.



Question 04

(100 marks)

4.1.



4.1.1. Identify the given chemical structure of the drug.

(10 marks)

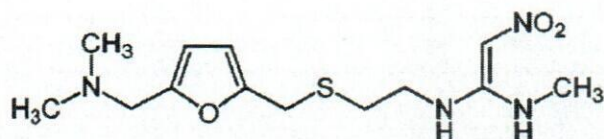
4.1.2. What is the group of this drug?

(10 marks)

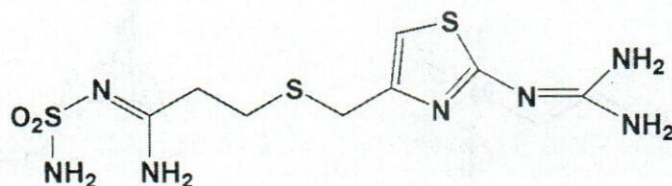
4.2. Identify the chemical structures given below.

(40 marks)

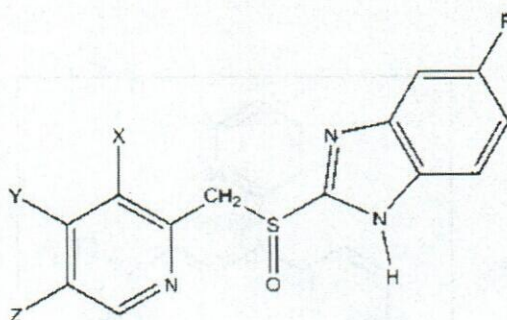
4.3.1



4.3.2

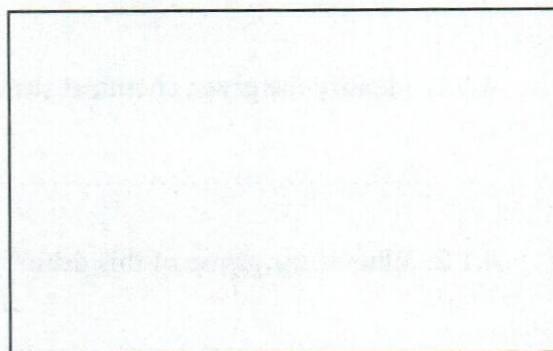
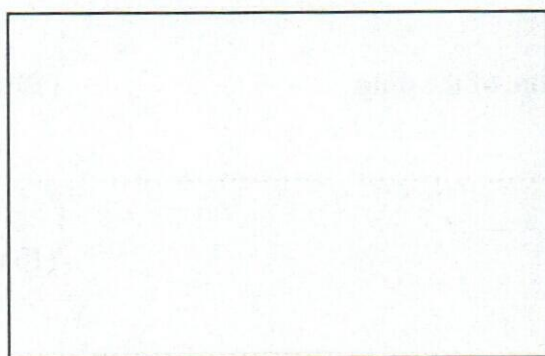


4.3. Draw the following chemical structures by using the given pharmacophore. (40 marks)



4.3.1. Omeprazole

4.3.2. Pantoprazole

**Question 05****(100 marks)**

5.1. Define the term partition coefficient (P).

(20 marks)

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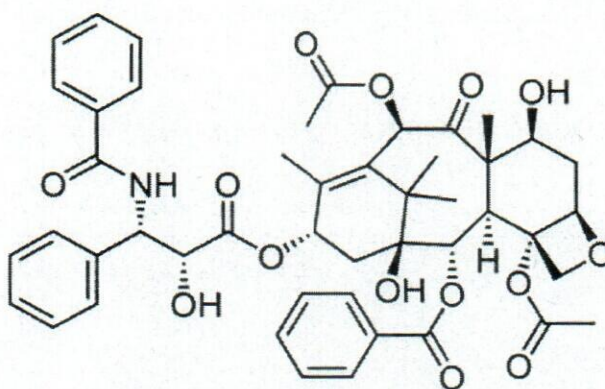
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5.2. State the importance of Lipinski's *Rule of Five* in drug design.

(30 marks)

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 5.3. Identify whether the following drug could be considered as a satisfactory drug candidate of potential bioavailability, with the reasons. (50 marks)



$C_{47}H_{51}NO_{13}$
 MW= 837

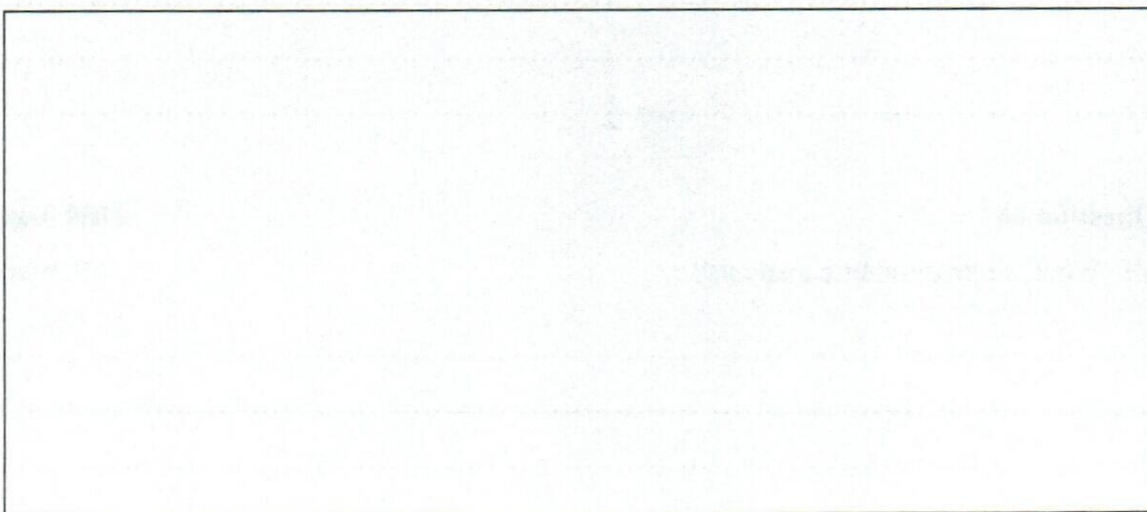
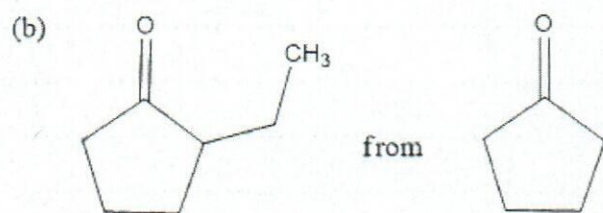
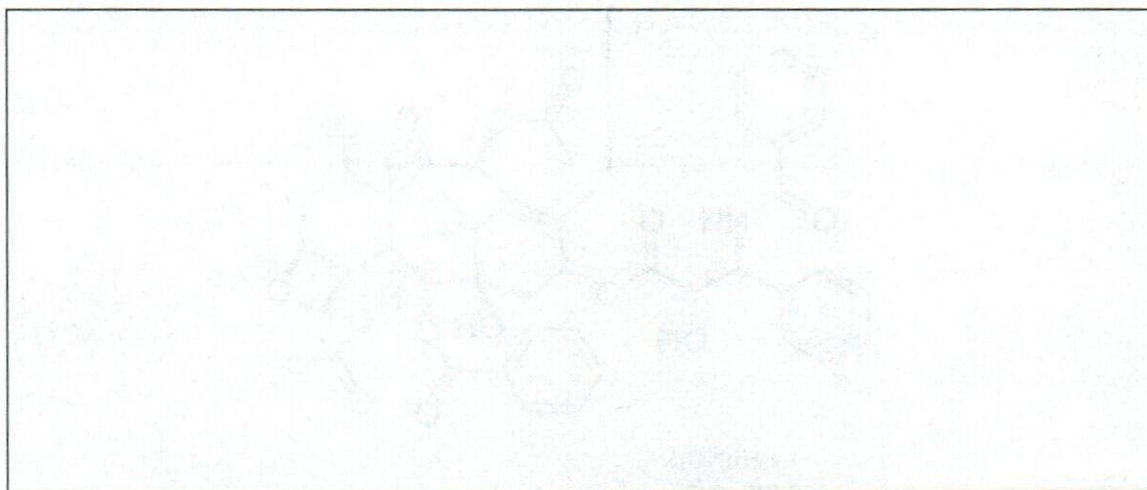
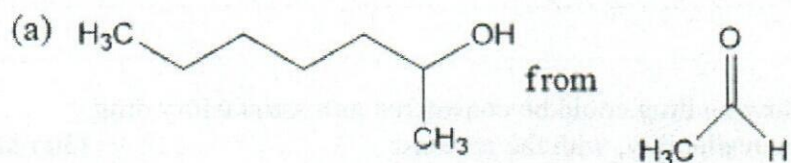
Question 06

(100 marks)

6.1. What is retrosynthetic analysis?

(20 marks)

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6.2. Show how you would carry out retrosynthetic analysis on each of the following molecules using provided starting materials. (80 marks)



Faculty of Health Sciences
Bachelor of Science Honours in Industrial Pharmaceutical Science
IPS 3153 Advanced Analytical Techniques
Batch 06
3rd Year 1st Semester
End Semester Examination - SEQ

INDEX NUMBER:

Date : 23rd of May 2025

Time : 9.00 a.m. - 12.00 noon (Three hours)

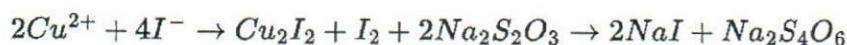
INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** questions.
- Answer **ALL** the questions on this paper itself.
- Final answers should be given legibly in black or blue ink.

Question 01

(100 marks)

In the iodometric estimation of Cu^{2+} ions in a 100 ml unknown sample, 120 ml of 1 M sodium thiosulfate solution is needed to oxidize the liberated Iodine. The following reactions occur during the process of titration analysis.



1.1 Write the stepwise experimental procedure involved in this analysis.

(30 Marks)

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1.2 Calculate the moles of Cu^{2+} in the sample.

(30 marks)

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1.3 Calculate the molarity of Cu^{2+} in the unknown solution.

(20 marks)

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1.4 Why is the starch solution added to the reaction mixture just before the end point?

(20 marks)

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Question 02

(100 marks)

2.1 What types of energy transitions are detected in UV-Visible spectroscopy? Explain using a schematic diagram.

(30 marks)



2.2 What type of different vibrations occur in a chemical bond that can be detected by infrared spectroscopy?

(20 marks)

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2.3 ^1H -NMR data of the compound $\text{C}_6\text{H}_{12}\text{O}$ is given below.

^1H -NMR: 2.58 ppm (septet; integral = 1), 2.45 ppm (quartet; integral = 2), 1.07 ppm (doublet; integral = 6), and 1.01 ppm (triplet; integral = 3).

The compound also shows a peak at 205 ppm in its ^{13}C NMR.

2.3.1 Sketch the ^1H -NMR spectrum and explain the splitting patterns.

(30 marks)

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2.3.2 Draw the proposed structure of the compound.

(20 marks)

Question 03

(100 marks)

3.1 Differentiate adsorption chromatography and partition chromatography.

(30 marks)

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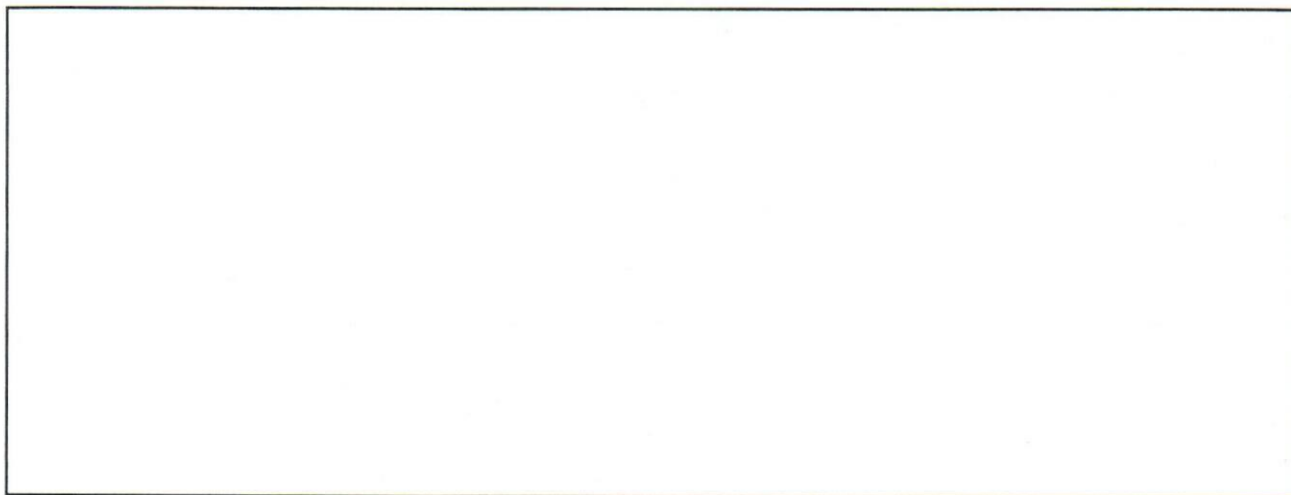
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Question 04**(100 marks)**

- 4.1 Draw a schematic diagram of High Performance Liquid Chromatography (HPLC), naming all the essential components. (30 marks)



- 4.2 Write a short account of normal phase and reverse phase columns in HPLC. (20 marks)

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- 4.3 Compare and distinguish between the polyacrylamide gel electrophoresis and the agarose gel electrophoresis. (30 marks)

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- 4.4 What are the functions of carrier gas and the makeup gas in capillary gas chromatography? (20 marks)

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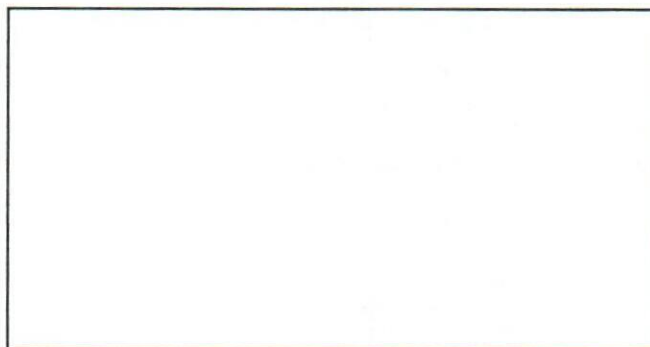
Question 05**(100 marks)**

5.1 What are the steps in a gravimetric analysis?

(30 marks)

5.2 In the determination of Ni content in a salt, 0.3 g of Ni salt is dissolved in 150 ml of water and 1:1 diluted HCl was added to the solution and heat it to 70 °C and 70 ml of dimethyl glyoxime $[C_4H_6(NO)_2]$ is added to the solution. Dilute NH_4OH is added dropwise to the mixture with stirring. The formed red precipitate was allowed to stand at room temperature for thirty minutes. The precipitate was filtered and dried in an oven to obtained 1.2 g of dried precipitate. (MW of dimethyl glyoxime is 116 and the atomic weight of Ni is 59)

5.2.1 Draw the structure of the nickel dimethyl glyoxime.

(20 marks)

5.2.2 What is the function of adding dilute ammonia to the precipitating mixture?

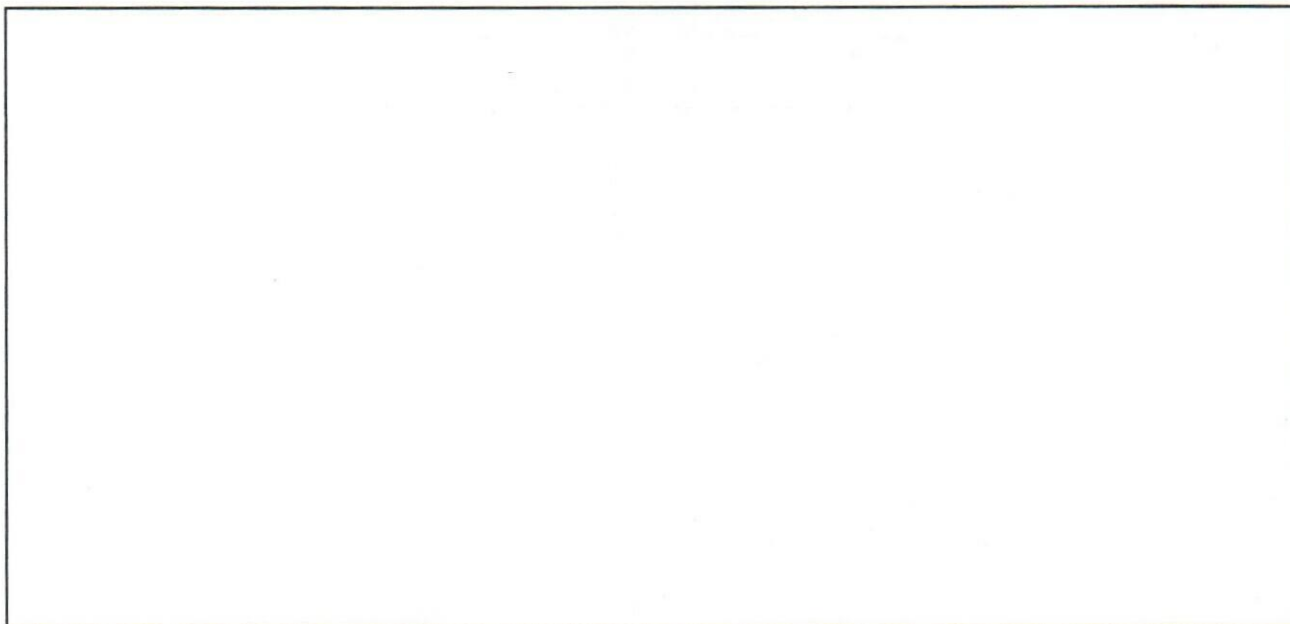
(20 marks)

5.2.3 Calculate the Ni percentage (%) in the original salt.

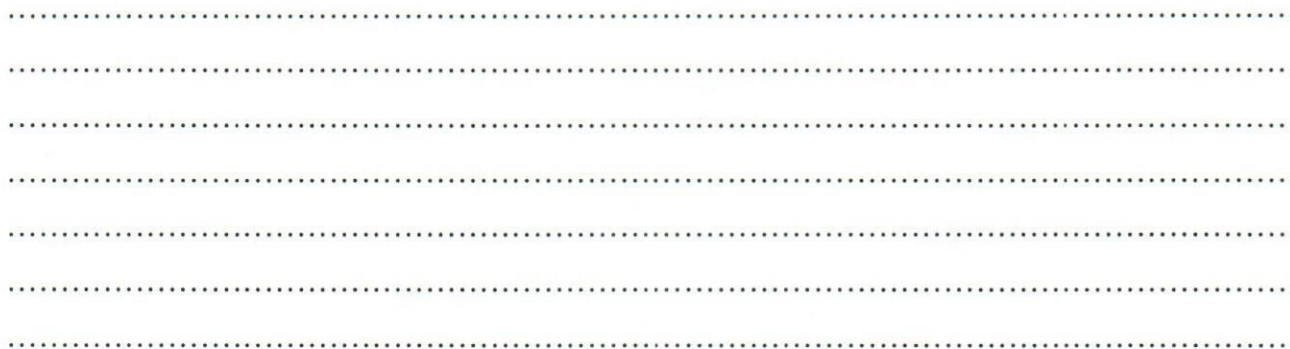
(30 marks)

Question 06**(100 marks)**

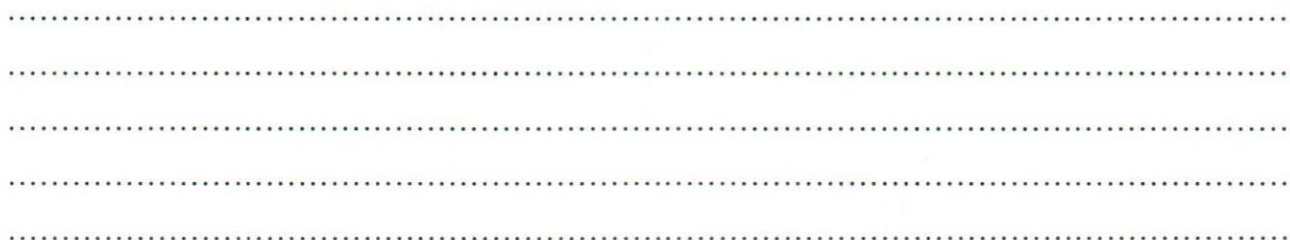
- 6.1 Draw the graph of **pH versus volume of titrant** in the titration of phosphoric acid (triprotic acid) with the titrant NaOH solution. (30 marks)



- 6.2 If the solubility of AgCl in water is 0.0015 g/L, calculate the solubility product (K_{sp}) of AgCl. (20 marks)



- 6.3 Mention the Mohr's method in the determination of end point of precipitation titration. (20 marks)



6.4 Karl Fisher volumetric titration was carried out to determine the water content in lidocaine HCl. Given that 0.025 g of water is equivalent to Karl Fisher reagent (KFR) 5.249 ml and 0.1564 g of lidocaine HCl is equivalent to KFR 2.094 ml, find the water percentage of lidocaine HCl.

(30 marks)

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Faculty of Health Sciences
Bachelor of Science Honors in Industrial Pharmaceutical Science
IPS 3143 Industrial Pharmaceutics II
Batch 06
3rd Year 1st Semester
End Semester Examination - SEQ

INDEX NUMBER:

Date : 21st of May 2025

Time : 9.00 a.m. - 12.00 noon (Three hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** questions.
- Answer **ALL** the questions on this paper itself.
- Final answers should be given legibly in black or blue ink.

Question 01

(100 marks)

1.1 State **four (04)** characteristics of hard gelatin capsules.

(20 marks)

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1.2 Differentiate primary and secondary packaging of pharmaceuticals.

(20 marks)

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1.3 Write an account on mouthwashes and gargles as liquid dosage forms.

(30 marks)

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 1.4 State the working mechanism and **two (02)** examples for each of the following types of excipients used in solution dosage forms.

1.4.1 Antioxidants (15 marks)

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1.4.2 Wetting agents (15 marks)

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Question 02 (100 marks)

2.1 What is a 'deflocculated suspension'? (20 marks)

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2.2 Zeta potential is an electrokinetic property of a drug particle.

2.2.1 What is zeta potential? (20 marks)

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2.2.2 How does zeta potential affect the stability of a suspension? (20 marks)

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2.3 Write an account on thickening agents.

(20 marks)

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2.4 State packaging, labelling, and storage requirements of suspension dosage forms.

(20 marks)

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Question 03

(100 marks)

3.1 List the characteristics of nanoemulsions.

(15 marks)

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3.2 What is dry gum method of emulsion manufacture?

(20 marks)

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3.3 Write an account on phase inversion of an emulsion.

(30 marks)

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3.4 Outline different process variables that affect the emulsion stability. (35 marks)

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Question 04 (100 marks)

4.1 List **five (05)** basic principles of Good Manufacturing Practices (GMP). (25 marks)

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4.2 State the importance of standardization of a pharmaceutical product. (25 marks)

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4.3 Compare and contrast thermosetting plastics and thermoplastics used in material fabrication.

(20 marks)

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4.4 Outline the key chemical factors that must be considered when selecting materials for pharmaceutical construction.

(30 marks)

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Question 05

(100 marks)

5.1 List **three (03)** ideal requirements for parenteral dosage form.

(15 marks)

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5.2 Mention the different categories of parenteral preparations.

(15 marks)

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5.3 State the importance of **implants** as a parenteral preparation.

(25 marks)

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5.4 Compare sterile water for injection and bacteriostatic water for injection. (25 marks)

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5.5 What are the tests used for the sterility testing of parenteral formulations? (20 marks)

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Question 06 (100 marks)

6.1 List **three (03)** quality control tests conducted for liquid dosage forms. (15 marks)

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6.2 State **four (04)** uses of large volume parenterals. (20 marks)

6.3 Outline the disintegration test conducted for uncoated tablets.

(25 marks)

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6.4 Mention the procedure for performing a capsule weight variation test according to pharmacopeial guidelines.

(35 marks)

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Faculty of Health Sciences
Bachelor of Science Honors in Industrial Pharmaceutical Science
IPS 3133 – Advanced Medicinal Chemistry I
Batch – 06
3rd year 1st semester
End Semester SEQ Examination

Date	: 19th of May 2025
Time	: 09.00 a.m. – 12.00 p.m. (Three hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.
- You are allowed to use non-programmable calculators.

Question 01

(100 marks)

1.1. State **two (02)** structural features of a drug according to the Lipinsk's rule of five.

(20 marks)

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1.2. What is the main function of hydroxyl groups in a drug and explain how it can be modified to improve the efficacy of the drug?

(30 marks)

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1.3. Write down **three (03)** parameters to be improved/changed by modification of lead compound.

(30 marks)

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1.4. State the estimation of an effective dose of a drug using the dose versus % dose responding graph. (20 marks)

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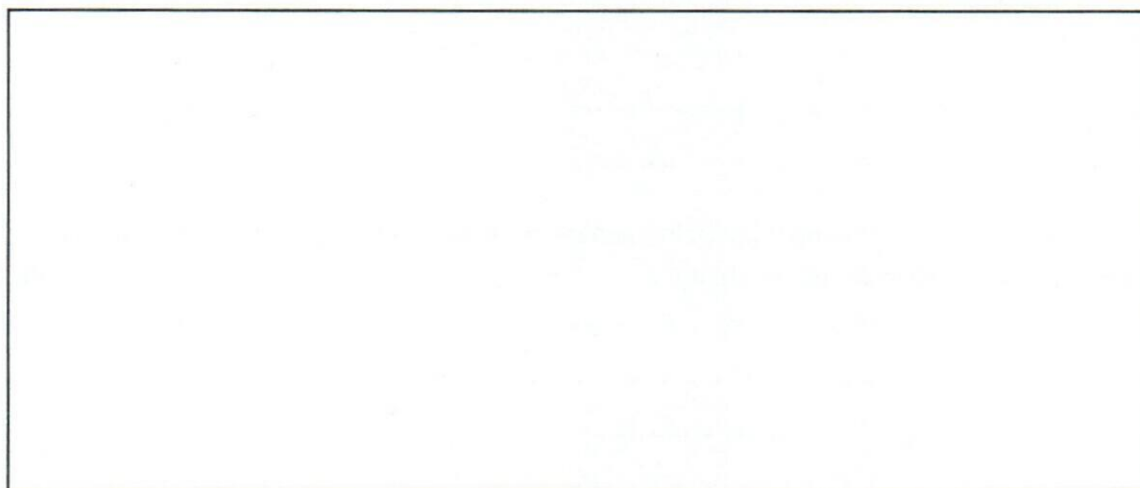
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Question 02

(100 marks)

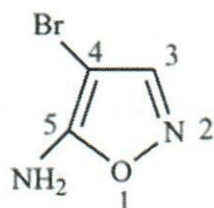
2.1. Draw the basic chemical structures of oxazol, thiazole and imidazole. (30 marks)



2.2. Write the IUPAC name of the following two structures.

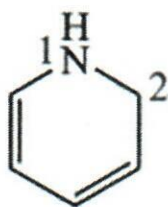
(20 marks)

2.2.1.



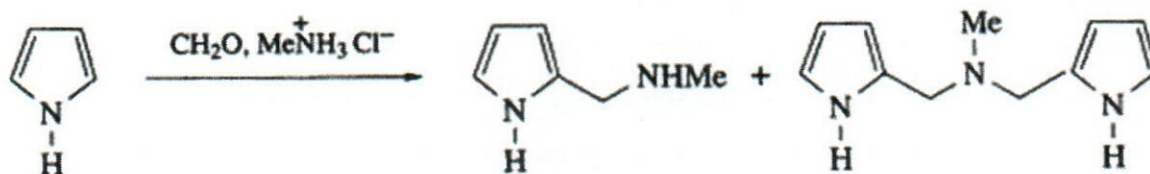
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2.2.2.



2.3. Write a suitable mechanism for the reaction given below.

(30 marks)



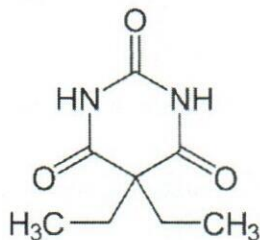
2.4. Vasopressin binds to two receptors V1 and V2. State the function of the two receptors. (20 marks)

Question 03

(100 marks)

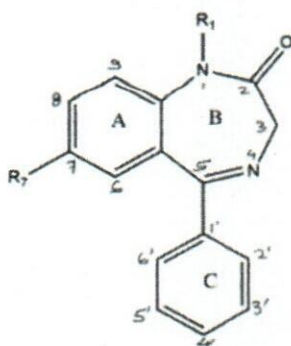
- 3.1. Identify **two (02)** possible synthones for the synthesis of barbital using the retrosynthetic analysis (20 marks)

Barbital



- 3.2. State a suitable mechanism for the synthesis of barbital using the synthones you proposed above. (20 marks)

- 3.3. The basic ring system of benzodiazepine is given below.



- 3.3.1. Give **two (02)** different substituents with their position on the ring that would enhance the activity. (20 marks)

3.3.2. What substituents on the ring B would reduce the activity?

(10 marks)

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3.4. Compare the differences in aminoacids in Bovine, porcine and human insuline. (30 marks)

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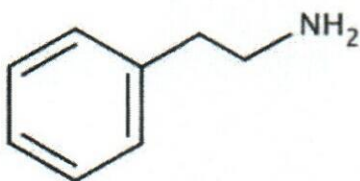
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Question 04

(100 marks)

4.1. Draw the following chemical structures by using the given pharmacophore. (30 marks)



4.1.1. Norepinephrine

4.1.2. Epinephrine

4.2. What is the chemical modification done in terbutaline to increase the beta 2 activity and decrease the enzyme metabolism? (20 marks)

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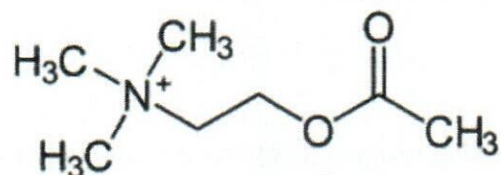
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4.3. Identify the chemical structure given below.

(20 marks)



4.4. How does the activity of the above compound change with the following modifications?

(30 marks)

4.4.1. Presenting with a tertiary amine group

4.4.2. Presenting of two ethyl groups on amine group

4.4.3. Presenting of three carbon atoms bridge

Question 05

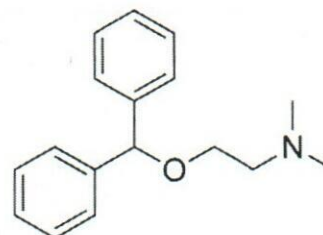
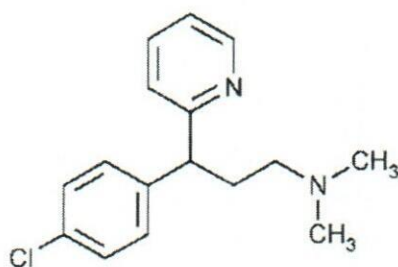
(100 marks)

5.1. Identify the class of below mentioned anti-histamines.

(20 marks)

5.1.1.

5.1.2.



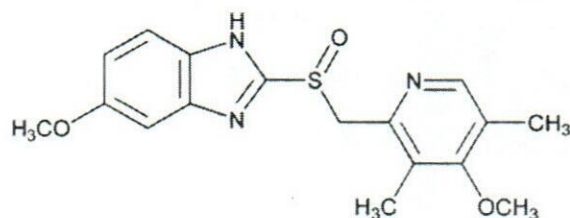
5.2. What happens to the antihistaminic activity when one of the phenyl rings in compound 5.1.2 is replaced with a 2-pyridyl group?

(20 marks)

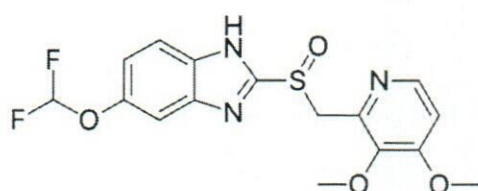
5.3. Identify the chemical structures of proton pump inhibitor given below.

(30 marks)

5.3.1

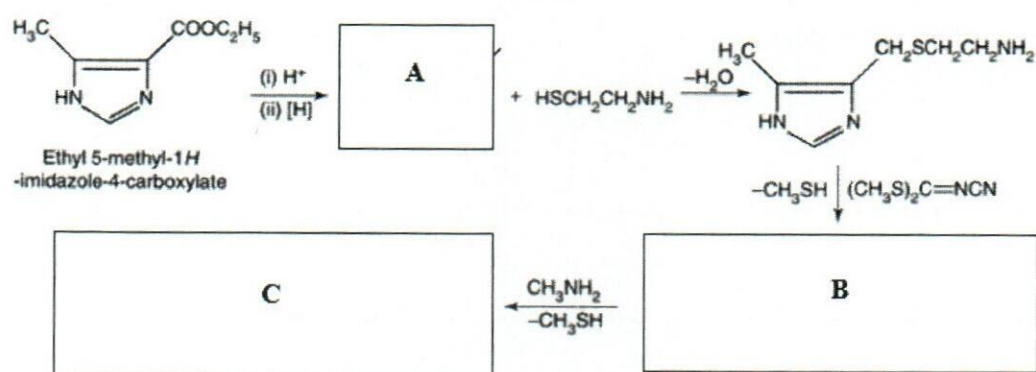


5.3.2



5.4. Draw the structures of intermediates A, B, and C involved in the synthesis of cimetidine.

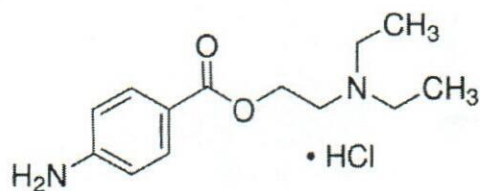
(30 marks)



Question 06**(100 marks)**

6.1. Identify the structure of the given drug.

(20 marks)



6.2. Mention how the substitution of a nitro group on the aromatic ring affects the activity of the given drug in 6.1. (35 marks)

6.3. "Indomethacin is known to be chemically unstable in aqueous environments". Comment on the above statement. (20 marks)

6.4. Meclofenamic acid has greater anti-inflammatory activity than mefenamic acid. State the structural changes responsible for this significant difference. (25 marks)