

[LB 4257]

AUGUST 2012

Sub. Code: 4257

SECOND YEAR B.PHARM. EXAM

Paper II – PHARMACEUTICAL ANALYSIS AND PHYSICAL CHEMISTRY

Q.P. Code : 564257

Time : Three hours

Maximum: 100 Marks

(180 Min) Answer ALL questions in the same order.

Answer Section A and B in SEPARATE Answer Book.

SECTION A

(PHARMACEUTICAL ANALYSIS)

I. Elaborate on:

Pages Time Marks
(Max.)(Max.)(Max.)

- | | | | |
|--|----|----|----|
| 1. a) Explain in detail about oxygen flask combustion method? | | | |
| b) Masking and de-masking agents in complexometric titrations. | 19 | 33 | 20 |

II. Write notes on:

- | | | | |
|---|---|---|---|
| 1. How do you determine the acid value? | 3 | 8 | 5 |
| 2. Write notes on dead stop end point? | 3 | 8 | 5 |
| 3. Write the mechanism of buffer and its applications? | 3 | 8 | 5 |
| 4. What is Gasometry? Give the procedure for the assay of oxygen? | 3 | 8 | 5 |

III. Short Answers:

- | | | | |
|---|---|---|---|
| 1. Define iodometry? | 1 | 5 | 2 |
| 2. Give the example of acid-base indicators? | 1 | 5 | 2 |
| 3. What is plane polarized light? How it is achieved? | 1 | 5 | 2 |
| 4. Define chelating agents? | 1 | 5 | 2 |
| 5. What is a real and ideal solution? | 1 | 5 | 2 |

SECTION – B

(PHYSICAL CHEMISTRY)

IV. Elaborate on:

- | | | | |
|---|----|----|----|
| 2. Define and explain the various types of colligative properties. Write the methods used for determining the elevation of boiling point? | 19 | 33 | 20 |
|---|----|----|----|

V. Write notes on:

- | | | | |
|--|---|---|---|
| 1. Explain Debye-Huckel's theory? | 3 | 8 | 5 |
| 2. Explain Phase rule and the terms phase, component and degrees of freedom? | 3 | 8 | 5 |
| 3. What is plane polarized light? How it is achieved? | 3 | 8 | 5 |
| 4. Explain Hess law of constant heat of summation? | 3 | 8 | 5 |

VI. Short Answers:

- | | | | |
|--|---|---|---|
| 1. Define partition co-efficient? | 1 | 5 | 2 |
| 2. State second law of thermodynamics? | 1 | 5 | 2 |
| 3. What is Nernst distribution? | 1 | 5 | 2 |
| 4. Define order of reaction? | 1 | 5 | 2 |
| 5. What is adsorption? | 1 | 5 | 2 |

[LC 4257]

FEBRUARY 2013

Sub. Code: 4257

SECOND YEAR B.PHARM. EXAM

**Paper II – PHARMACEUTICAL ANALYSIS AND PHYSICAL
CHEMISTRY**

Q.P. Code : 564257

**Time : Three hours
(180 Min)**

Maximum: 100 Marks

Answer Section A and B in SEPARATE Answer Book.

SECTION – A

(PHARMACEUTICAL ANALYSIS)

I. Elaborate on: (2x10=20 marks)

1. a) Explain the different types of complexometric titrations by using various titrants with suitable examples.
- b) Masking and demasking agents in complexometric titrations.

II. Write notes on: (4x5=20 marks)

1. Write the importance of quality control of drugs.
2. Write a note on kjeldhal method of nitrogen estimation.
3. Define co-precipitation and post precipitation. Give notes on various step involved in Gravimetric analysis.
4. Give the Henderson- Hasselbalch equation.

III. Short Answers: (5x2=10 marks)

1. Werner's co-ordination number.
2. Define common ion effect.
3. Give some examples of oxidizing and reducing agents.
4. Define Redox potential.
5. Define Accuracy.

SECTION – B

(PHYSICAL CHEMISTRY)

I. Elaborate on: (2x10=20 marks)

1. a) Explain the Second law of Thermodynamics.
- b) Explain in detail about the Joule-Thomson effect.

II. Write notes on: (4x5=20 marks)

1. Explain the Carnot cycle.
2. Define Adsorption isotherm. Explain Freundlich adsorption isotherm.
3. Write in detail about the Bomb calorimeter.
4. Explain the Assay of Oxygen.

III. Short Answers: (5x2=10 marks)

1. Define internal energy.
2. Enthalpy of a reaction.
3. Define catalyst.
4. Define ideal solutions and real solutions.
5. Define Adsorption.

(LD 4257)

AUGUST 2013

Sub. Code: 4257

SECOND YEAR B.PHARM. EXAM
PAPER II – PHARMACEUTICAL ANALYSIS & PHYSICAL
CHEMISTRY

Q.P. Code: 564257

Time: Three Hours

Maximum: 100 marks

Answer All Questions
Answer Section-A and B in separate Answer Book
SECTION-A
(Pharmaceutical Analysis)

- I. Elaborate on:** (1 x 20 =20)
- 1.a) What is buffer solution and explain about the buffer mixture of a weak acid and weak base and its salts.
 - b) Explain in detail about the Non aqueous titrations.
- II. Write Notes on:** (4 x 5 =20)
1. Write a note on diazotization titrations.
 2. Explain complexometric titrations.
 3. Write a note on Mohr's method and Fajan's method.
 4. Write a note on standardization of perchloric acid.
- III. Short Answers:** (5 x 2 =10)
1. Define precision.
 2. Define iodimetry.
 3. Define law of mass action.
 4. Calibration of volumetric apparatus.
 5. Choice of indicators.

SECTION-B
(Physical Chemistry)

- I. Elaborate on:** (1 x 20 =20)
1. a) Define rate of reaction clarify with suitable examples and derive the equation for first order reaction.
 - b) Explain Hess's law of constant heat of summation.
- II. Write Notes on:** (4 x 5 =20)
1. Define Colligative properties.
 2. Joule-Thomson effect.
 3. Define solutions with its types.
 4. Write about the factors affecting the rate of chemical reaction.
- III. Short Answers:** (5 x 2 =10)
1. Trouton's rule.
 2. Define Phase rule.
 3. Freundlich adsorption isotherm.
 4. Enthalpy of combustion.
 5. Second law of thermodynamics.

(LE 4257)

FEBRUARY 2014

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SECOND YEAR B.PHARM. EXAM
PAPER II – PHARMACEUTICAL ANALYSIS & PHYSICAL
CHEMISTRY

Q.P. Code: 564257

Time: Three Hours

Maximum: 100 marks

Answer All Questions
Answer Section-A and B in separate Answer Book
SECTION-A
(Pharmaceutical Analysis)

I. Elaborate on: (1 x 20 =20)

1. a) Explain the various types of solvents used in Non – aqueous titration.
- b) Write in detail about preparation and standardisation of acetic perchloric acid including the precautions to be taken.

II. Write Notes on: (4 x 5 =20)

1. Write notes on Modified Volhard's method.
2. Explain choice of indicators in acid – base titrations.
3. Give an account on the preparation and standardisation of ceric ammonium sulphate.
4. Write notes on pM indicators.

III. Short Answers: (5 x 2 =10)

1. Define redox potential.
2. What is Lewis theory of acids and bases?
3. Define saponification value.
4. What is iodometry?.
5. Define normality and molarity.

SECTION-B
(Physical Chemistry)

I. Elaborate on: (1 x 20 =20)

1. a) Define order of reaction. Explain the various methods for determining the order of reaction.
- b) State and explain First Law of Thermodynamics

II. Write Notes on: (4 x 5 =20)

1. Write a note on characteristics of catalyst.
2. State Raoult's law.
3. Calculate the half life of first order reaction.
4. Explain Partition co-efficient with limitation.

III. Short Answers: (5 x 2 =10)

1. What is Parachor?
2. Define Eutectic point.
3. What are Positive and Negative Catalysts?
4. Define Triple Point.
5. Define Enthalpy of formation.

[LF 4257]

AUGUST 2014

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SECOND YEAR B.PHARM. DEGREE EXAMINATION

Paper II – PHARMACEUTICAL ANALYSIS & PHYSICAL CHEMISTRY

Q. P. Code: 564257

Time: Three Hours

Maximum: 100 Marks

Answer All Questions

Answer Section-A and B in separate Answer Book

SECTION-A

(PHARMACEUTICAL ANALYSIS)

I. Essay: (2 x 20 = 40)

1. a) Explain in detail about theory of acid-base indicators with example.
- b) Give an account on diazotization titration.

II. Short Notes: (4 x 5 = 20)

1. Write note on calibration of apparatus
2. Preparation and standardization of perchloric acid
3. P^M Indicators
4. Mohr's method.

III. Short Answers: (5 x 2 = 10)

1. Buffer
2. Quality control
3. Redox Indicator
4. Chelation
5. Saponification value.

SECTION-B

(PHYSICAL CHEMISTRY)

I. Essay: (2 x 20 = 40)

1. a) Explain about methods of determination of depression of freezing point
- b) Theories of rate of reaction.

II. Short Notes: (4 x 5 = 20)

1. Explain bond energy with example
2. First law of thermodynamics
3. Langmuir isotherm
4. Theory of catalysis

III. Short Answers: (5 x 2 = 10)

1. Define Spontaneous process
2. Colligative properties with example
3. Exo and Endo thermic reactions
4. Refractive index
5. Phase.

(LG 4257)

FEBRUARY 2015

Sub. Code: 4257

**B.PHARM. EXAMINATION
SECOND YEAR
PAPER II – PHARMACEUTICAL ANALYSIS & PHYSICAL CHEMISTRY
Q.P. Code: 564257**

Time: Three hours

Maximum: 100 marks

**Answer All Questions
Answer Section-A and B in separate Answer Book**

**SECTION-A
(Pharmaceutical Analysis)**

I. Essay: (2 x 10 = 20)

1. a) Give an account on theory of non-aqueous titration and also mention about its application in pharmacy.
- b) Write note on Iodimetry and Iodometry titration.

II. Short notes: (4 x 5 = 20)

1. Write notes on error
2. Law of mass action
3. Assay of calcium gluconate
4. Volhard's methods

III. Short answers: (5 x 2 = 10)

1. Precision
2. Indicators
3. Co-precipitation
4. Iodine value
5. Ligands

**SECTION-B
(Physical Chemistry)**

I. Essay: (2 x 10 = 20)

1. a) Give an account on determination methods of osmotic pressure.
- b) Factors affecting adsorption and application of adsorption in pharmacy.

II. Short notes: (4 x 5 = 20)

1. Phase rule and its application
2. Hess's law of constant heat of summation
3. Entropy and its significance
4. Explain the principle involved in polarimetry

III. Short answers: (5 x 2 = 10)

1. Third law of thermodynamics
2. Adsorption isotherm
3. Rate of reaction
4. Auto catalyst
5. Molecularity of reaction

B.PHARM. DEGREE EXAMINATION**SECOND YEAR****PAPER II – PHARMACEUTICAL ANALYSIS & PHYSICAL CHEMISTRY****Q.P. Code: 564257****Time : Three Hours****Maximum : 100 marks****Answer All Questions****SECTION – A
(PHARMACEUTICAL ANALYSIS)****I. Essay:** (2 x 10 = 20)

1. a) Write in detail about the acid base concepts and buffer solutions with examples.
- b) Explain the determination of carbonates and bicarbonates in a mixture.

II. Short notes : (4 x 5 = 20)

1. Write a note on common ion effect.
2. Explain the various methods of end point detection in complexometric titration.
3. Write note on nitrogen estimation by Kjeldhal method.
4. Explain with reactions the principle involved in Mohr's method.

III. Short answers: (5 x 2 = 10)

1. Define accuracy.
2. What is Nernst equation?
3. What is Iodimetry and Iodometry?
4. What is solvent leveling effect?
5. Define acid value and mention its importance.

**SECTION – B
(PHYSICAL CHEMISTRY)****I. Essay:** (2 x 10 = 20)

1. Define Colligative properties? List the various types of Colligative properties.
Explain in detail the determination of the elevation of Boiling point and Osmotic Pressure.

II. Short notes : (4 x 5 = 20)

1. State and explain Joule-Thomson effect.
2. Describe the various factors affecting adsorption.
3. Define catalyst and explain the characteristics of catalysts.
4. Explain how will you determine the heat of combustion using Bomb calorimeter.

III. Short answers: (5 x 2 = 10)

1. Define ideal solution.
2. List the various factors affecting rate of chemical reaction.
3. State Lavoisier-Laplace law.
4. Define plane polarized light.
5. State Troutons rule.

(LI 4257)

FEBRUARY 2016

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**B.PHARM. EXAMINATION
SECOND YEAR
PAPER II – PHARMACEUTICAL ANALYSIS & PHYSICAL CHEMISTRY**

Q.P. Code: 564257

Time: Three hours

Maximum: 100 Marks

Answer All Questions

SECTION-A

(Pharmaceutical Analysis)

I. Essay:

(2 x 10 = 20)

1. a) Explain in detail about different types of complexometric titrations with examples.
- b) What are the different indicators used in complexometric titrations? Explain the use of Masking and Demasking agents.

II. Short notes:

(4 x 5 = 20)

1. Write a note on diazotization titration.
2. Explain how you will determine calcium by gravimetric analysis.
3. Explain the various solvents used in nonaqueous titration.
4. Illustrate with reaction and examples, the principle involved in Volhard's method.

III. Short answers:

(5 x 2 = 10)

1. Define significant figure.
2. State law of mass action.
3. Explain the theory of redox titrations.
4. Name a basic titrant and an indicator for titrating a weak acid in non aqueous titration.
5. Define buffer solution.

SECTION-B

(Physical Chemistry)

I. Essay:

(2 x 10 = 20)

1. a) Define order of reaction, molecularity, Rate of Reaction and Rate constant.
- b) Explain the various methods of determining order of reaction.

II. Short notes:

(4 x 5 = 20)

1. Define solution. List out the type of solutions with examples.
2. Define internal energy and enthalpy. Write the relationship between ΔH and ΔE .
3. Explain the following
 - a) Enthalpy of precipitation
 - b) Concept of activation energy.
4. Explain the theories of reaction rate.

III. Short answers:

(5 x 2 = 10)

1. Define enzyme catalyst.
2. What is exothermic and endothermic reaction?
3. Define adsorption isotherm.
4. Define zero entropy.
5. Define specific rotation.

(LJ 4257)

AUGUST 2016

Sub. Code: 4257

**B.PHARM. EXAMINATION
SECOND YEAR
PAPER II – PHARMACEUTICAL ANALYSIS & PHYSICAL CHEMISTRY**

Q.P. Code: 564257

Time: Three hours

Maximum: 100 Marks

Answer All Questions

**SECTION-A
(PHARMACEUTICAL ANALYSIS)**

I. Essay: (1 x 20 = 20)

1. a) Explain the principle of Non Aqueous Titrations.
b) Write in detail about the preparation, standardization of perchloric acid and assay of any one weak base estimated by non-aqueous titration.

II. Short notes: (4 x 5 = 20)

1. Briefly explain the preparation and standardization of ceric ammonium sulphate solution.
2. Write a note on calibration of volumetric apparatus.
3. Explain neutralization curves with examples.
4. Briefly explain the various types of complexometric titrations with examples.

III. Short answers: (5 x 2 = 10)

1. Define pH and write Henderson-Hasselbalch equation.
2. Define common ion effect.
3. Define redox potential.
4. Define saponification value.
5. Define co-precipitation and post precipitation.

**SECTION-B
(PHYSICAL CHEMISTRY)**

I. Essay: (1 x 20 = 20)

1. Explain in detail the Carnot theorem.

II. Short notes: (4 x 5 = 20)

1. State and explain Hess's law of constant heat summation.
2. Explain the principle and instrumentation of polarimeter.
3. Explain partition coefficient with example.
4. Define adsorption and explain Freundlich adsorption isotherm.

III. Short answers: (5 x 2 = 10)

1. Define refractive index.
2. Define homogenous and heterogeneous catalyst.
3. Define molecularity of reaction.
4. Define enthalpy of neutralization.
5. What is phase rule?

(LK 4257)

FEBRUARY 2017

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**B.PHARM. EXAMINATION
SECOND YEAR
PAPER II – PHARMACEUTICAL ANALYSIS & PHYSICAL CHEMISTRY**

Q.P. Code: 564257

Time: Three hours

Maximum: 100 Marks

Answer All Questions

**SECTION-A
(PHARMACEUTICAL ANALYSIS)**

I. Elaborate on: (1 x 20 = 20)

1. a) Define buffer. Give examples. What are applications of buffer solution in pharmacy?
b) Describe in detail about Henderson-hasselbalch equation.

II. Write notes on: (4 x 5 = 20)

1. Explain the determination of saponification value.
2. Write the note on standardization of perchloric acid.
3. Explain about masking and demasking agents.
4. Explain the mechanism involved in oxidation reduction titration.

III. Short answers on: (5 x 2 = 10)

1. Errors.
2. Nernst equation.
3. Define ligands.
4. Werner's co-ordination number.
5. Define precision.

**SECTION-B
(PHYSICAL CHEMISTRY)**

I. Elaborate on: (1 x 20 = 20)

1. Define and explain the various types of Colligative properties. Explain one method used for determining evaluation of boiling point.

II. Write notes on: (4 x 5 = 20)

1. Explain the construction and use of a polarimeter.
2. Write the relation between ΔH and ΔE .
3. Hess's law of heat summation.
4. Discuss graphically the Freundlich and Langmuir's, isotherms.

III. Short answers on: (5 x 2 = 10)

1. Define order of reaction.
2. Define types of catalyst.
3. Define Joules-Thomson effect.
4. State second law of thermodynamics.
5. Define Entropy.

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SECOND YEAR
PAPER II – PHARMACEUTICAL ANALYSIS & PHYSICAL CHEMISTRY**

Q.P. Code: 564257

Time: Three hours

Maximum: 100 Marks

Answer All Questions

**SECTION-A
(PHARMACEUTICAL ANALYSIS)**

I. Elaborate on: (1 x 20 = 20)

1. What is Argentimetric titration? Give a detailed account of different methods of argentimetric titration.

II. Write notes on: (4 x 5 = 20)

1. Explain gasometric method for the assay of oxygen.
2. Write the preparation and standardization of ceric ammonium sulphate.
3. Explain the procedure adopted for calibration of burette and pipette.
4. Explain the principle and procedure involved in the assay of calcium gluconate.

III. Short answers on: (5 x 2 = 10)

1. Define significant figure.
2. Define saponification value. What is its importance?
3. What is common ion effect?
4. What is leveling effect?
5. What is gravimetric analysis?

**SECTION-B
(PHYSICAL CHEMISTRY)**

I. Elaborate on: (1 x 20 = 20)

1. a) Define catalyst and briefly explain the types of catalyst. Write the important characteristics of a catalyst.
b) Explain the theories of catalysis with mechanism.

II. Write notes on: (4 x 5 = 20)

1. What is Phase Rule? With the help of a phase diagram explain one component system.
2. State and derive Raoult's law.
3. Define adsorption. Explain the factors affecting adsorption.
4. Define order of reaction. Write any two methods for determination of order of reaction.

III. Short answers on: (5 x 2 = 10)

1. Define enthalpy of combustion.
2. What is adiabatic system?
3. Nernst's distribution law.
4. What are complex reactions?
5. What is the acid-base concept according to Lewis theory?

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

(LM 4257)

FEBRUARY 2018

Sub. Code: 4257

**B.PHARM. DEGREE EXAMINATION
SECOND YEAR**

PAPER II – PHARMACEUTICAL ANALYSIS & PHYSICAL CHEMISTRY

Q.P. Code: 564257

Time: Three hours

Maximum: 100 Marks

Answer All Questions

**SECTION-A
(PHARMACEUTICAL ANALYSIS)**

I. Elaborate on: (1 x 20 = 20)

1. a) What is Non-Aqueous Titration? Write the types of solvents used in Non-Aqueous Titration with examples?
- b) Explain in detail about neutralization curve in acid base titration.

II. Write notes on: (4 x 5 = 20)

1. What is argentimetric titration? Explain briefly Mohr's method.
2. Write the preparation and standardization of potassium permanganate.
3. Explain the theories of acid-base indicators.
4. Give the principle and procedure behind Kjeldahl method of nitrogen estimation.

III. Short answers on: (5 x 2 = 10)

1. Define buffer capacity.
2. Define acid value. What is its importance?
3. What are chelating agents?
4. What is co-precipitation and post precipitation?
5. What is solubility product?

**SECTION-B
(PHYSICAL CHEMISTRY)**

I. Elaborate on: (1 x 20 = 20)

1. Define rate of reaction. Give a detailed account of the theories of reaction rates.

II. Write notes on: (4 x 5 = 20)

1. State and explain Joule-Thomson effect.
2. Define enthalpy of combustion. With a neat labeled diagram explain the working of bomb calorimeter.
3. Write short notes on adsorption isotherms.
4. Explain the principle and working of refractometer.

III. Short answers on: (5 x 2 = 10)

1. Define phase transfer catalyst and give examples.
2. What is ideal solution? Write any two characteristics of an ideal solution.
3. Lavoisier- Laplace law.
4. Define molar heat capacity and give its unit.
5. What is plane polarized light?

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SECOND YEAR**

PAPER II – PHARMACEUTICAL ANALYSIS & PHYSICAL CHEMISTRY

Q.P. Code: 564257

Time: Three hours

Maximum: 100 Marks

Answer All Questions

SECTION-A

(PHARMACEUTICAL ANALYSIS)

I. Elaborate on:

(1 x 20 = 20)

1. a) Explain the theory of redox titration. List out various types of redox titration based on titrant and give one example in each type.
- b) Write a note on redox potential.
- c) Classify redox indicator.

II. Write notes on:

(4 x 5 = 20)

1. Give a note on apparatus used in Gravimetric Analysis.
2. Write the principle involved in Law of Mass Action.
3. Give the preparation and standardization and 0.1M perchloric acid.
4. Explain briefly Modified Volhard's Method.

III. Short answers on:

(5 x 2 = 10)

1. Classify complexometric titration.
2. Define Kjeldhal Method.
3. Define Iodine Value.
4. What are Errors? Classify them.
5. Define Diazotisation titration.

SECTION-B

(PHYSICAL CHEMISTRY)

I. Elaborate on:

(1 x 20 = 20)

1. a) Define osmosis. Explain the theories of osmosis.
- b) What is osmotic pressure? Describe the various methods to determine osmotic pressure.
- c) Relationship between osmotic pressure and vapour pressure.

II. Write notes on:

(4 x 5 = 20)

1. Vant-Hoff equation and its application.
2. Enthalpy of Neutralization.
3. State and explain Langmuir adsorption isotherm.
4. Explain Catalyst and rate of reaction.

III. Short answers on:

(5 x 2 = 10)

1. Define Rate constant.
2. Define Optical activity.
3. Define Molar refraction.
4. State Raoult's law.
5. State Zeroth Law of Thermodynamics.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

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PAPER II – PHARMACEUTICAL ANALYSIS & PHYSICAL CHEMISTRY

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Answer All Questions

**SECTION-A
(PHARMACEUTICAL ANALYSIS)**

I. Elaborate on: (1 x 20 = 20)

1. a) Explain the calibration of volumetric Apparatus.
- b) Explain oxygen flask combustion method for the determination of Sulphur.

II. Write notes on: (4 x 5 = 20)

1. Write a note on Significant figure.
2. Preparation & standardization of Perchloric acid.
3. P^M Indicators.
4. Organic Precipitants in gravimetry.

III. Short answers on: (5 x 2 = 10)

1. Accuracy.
2. Saponification value.
3. Iodometry.
4. Argentimetry.
5. Co-precipitation.

**SECTION-B
(PHYSICAL CHEMISTRY)**

I. Elaborate on: (1 x 20 = 20)

1. a) Explain Hess's law of constant heat of summation.
- b) Write in detail about theories of order of Reaction.

II. Write notes on: (4 x 5 = 20)

1. Explain about Bomb Calorimeter.
2. Write a note on Partition coefficient with limitations.
3. Define solutions with its types.
4. State and explain Joule – Thomson Effect.

III. Short answers on: (5 x 2 = 10)

1. Enzyme Catalyst.
2. Eutectic Point.
3. Entropy.
4. Adsorption isotherm.
5. Refractive index.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

(LP 4257)

AUGUST 2019

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**B.PHARM. DEGREE EXAMINATION
SECOND YEAR
PAPER II – PHARMACEUTICAL ANALYSIS & PHYSICAL CHEMISTRY**

Q.P. Code: 564257

Time: Three hours

Maximum: 100 Marks

Answer All Questions

SECTION-A

(PHARMACEUTICAL ANALYSIS)

I. Elaborate on: (1 x 20 = 20)

1. Define Precipitation Titration. Briefly explain each type with indicators used in the titration.

II. Write notes on: (4 x 5 = 20)

1. Write a note on Masking and Demasking agents.
2. Explain about Diazotization titration.
3. Write a note on Volhards method.
4. Write a note on various steps involved in Gravimetric Analysis.

III. Short answers on: (5 x 2 = 10)

1. Buffer solution.
2. Law of Mass action.
3. Acid value.
4. Define Precision.
5. Redox Potential.

SECTION-B

(PHYSICAL CHEMISTRY)

I. Elaborate on: (1 x 20 = 20)

1. a) Explain in detail about the determination of the elevation of boiling point.
b) Explain the factors affecting adsorption and its applications in pharmacy.

II. Write notes on: (4 x 5 = 20)

1. Write a note on Catalysts.
2. Explain the principle involved in Polarimetry.
3. Give a short note on phase rule and its applications.
4. Define order and molecularity of reaction and explain the factors affecting rate of chemical reaction.

III. Short answers on: (5 x 2 = 10)

1. Ideal solution.
2. Second law of thermodynamics.
3. Exo and Endo thermic reactions.
4. Parachor.
5. Enthalpy.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

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**B.PHARM. DEGREE EXAMINATION
SECOND YEAR
PAPER II – PHARMACEUTICAL ANALYSIS & PHYSICAL CHEMISTRY**

Q.P. Code: 564257

Time: Three hours

Maximum: 100 Marks

Answer All Questions

SECTION-A

(PHARMACEUTICAL ANALYSIS)

I. Elaborate on: **(1 x 20 = 20)**

1. a) What is the underlying principle of Complexometric titration? Explain different types of Complexometric titration with suitable example.
- b) What is masking and demasking agents with reference to complexometric titration. Give specific examples to justify your statements.

II. Write notes on: **(4 x 5 = 20)**

1. Solvent used in non-aqueous titration.
2. Fajans method.
3. Kjeldahl method of nitrogen estimation.
4. Saponification value.

III. Short answers on: **(5 x 2 = 10)**

1. Gasometry.
2. Redox indicator.
3. Neutralization curve.
4. Organic precipitant.
5. Precision.

SECTION-B

(PHYSICAL CHEMISTRY)

I. Elaborate on: **(1 x 20 = 20)**

1. a) Define Debye-Huckel theory. What are the different types of solution give examples.
- b) Explain about Raoult's Law and its limitations.

II. Write notes on: **(4 x 5 = 20)**

1. Joule-Thomson effect.
2. Bomb calorimeter.
3. Freundlich Adsorption Isotherm.
4. Refractometry.

III. Short answers on: **(5 x 2 = 10)**

1. Order of reaction.
2. Biocatalyst.
3. First Law of Thermodynamics.
4. Exothermic reaction.
5. Partition coefficient.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LR 1220]

DECEMBER 2020

Sub. Code: 4257

(AUGUST 2020 EXAM SESSION)

B. PHARMACY DEGREE EXAMINATION

SECOND YEAR – (Regulation from 2009-2010)

PAPER II – PHARMACEUTICAL ANALYSIS & PHYSICAL CHEMISTRY

Q.P. Code: 564257

Time: Three hours

Answer ALL questions

Maximum: 100 Marks

**SECTION-A
(PHARMACEUTICAL ANALYSIS)**

I. Elaborate on: (1 x 20 = 20)

1. a) Discuss about Complexometric titrations and elaborate briefly about its types.
- b) Discuss briefly on the theory of indicators in Neutralization titrations.

II. Write notes on: (4 x 5 = 20)

1. Discuss about the factors and their influence on the solubility of precipitate.
2. Discuss about various preparation techniques used in gravimetric analysis.
3. Brief out on Kjeldhal method of nitrogen estimation.
4. Write note on calibration of apparatus.

III. Short answers on: (5 x 2 = 10)

1. Standardization of Perchloric acid.
2. Iodimetry and Iodometry.
3. Write a note on law of Mass action.
4. Werner's co-ordination number.
5. Post-precipitation.

**SECTION-B
(PHYSICAL CHEMISTRY)**

I. Elaborate on: (1 x 20 = 20)

1. a) Define Refractive index. Elaborate on the construction, principle of operation and applications of Refractometers.
- b) State phase rule and explain the application of phase rule in one component system.

II. Write notes on: (4 x 5 = 20)

1. State and explain Debye-Huckel theory.
2. State first law of Thermodynamics & Illustrate the relation between ΔH and ΔE .
3. State Lavoisier – Laplace law.
4. Define Catalyst. Explain the types of catalysts with examples.

III. Short answers on: (5 x 2 = 10)

1. Partition Coefficient.
2. Trouton's rule.
3. Third law of Thermodynamics.
4. Physical adsorption and chemical adsorption.
5. Factors affecting the rate of chemical reaction.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[BPHARM 0921]

**SEPTEMBER 2021
(FEBRUARY 2021 EXAM SESSION)**

Sub. Code: 4257

**B. PHARMACY DEGREE EXAMINATION
SECOND YEAR – (NON-SEMESTER)
PAPER II – PHARMACEUTICAL ANALYSIS & PHYSICAL CHEMISTRY
Q.P. Code: 564257**

Time: Three hours

Answer ALL questions

Maximum: 100 Marks

**SECTION-A
(PHARMACEUTICAL ANALYSIS)**

I. Elaborate on: (1 x 20 = 20)

1. a) Illustrate briefly on Neutralization curves and the choice of indicators in acid base titrations.
b) Explain briefly about Argentometric titrations and its various types.

II. Write notes on: (4 x 5 = 20)

1. Write a note on the types of Solvents used in non-aqueous titrations.
2. Discuss briefly about Masking and Demasking agent with examples.
3. Discuss about Nernst equation.
4. Brief out on oxygen flask combustion method.

III. Short answers on: (5 x 2 = 10)

1. Common ion effect.
2. Solubility product.
3. Co-precipitation.
4. Universal indicators.
5. Significant figure.

**SECTION-B
(PHYSICAL CHEMISTRY)**

I. Elaborate on: (1 x 20 = 20)

1. a) Define Colligative properties. Describe elaborately about the types of Colligative properties.
b) What is Adsorption? Explain briefly about Langmuir adsorption isotherm.

II. Write notes on: (4 x 5 = 20)

1. Write a note on Joule – Thomson effect.
2. Derive Vant-hoff equation and mention its use.
3. Enumerate the theory and mechanism of Catalysis.
4. Describe briefly theories involved in reaction kinetics.

III. Short answers on: (5 x 2 = 10)

1. Second law of Thermodynamics.
2. Define the terms phase, component and degree of freedom.
3. Bomb calorimeter.
4. Factors influencing adsorption.
5. Refractive index.

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[BPHARM 0122]

**JANUARY 2022
(AUGUST 2021 EXAM SESSION)**

Sub. Code: 4257

B.PHARMACY DEGREE COURSE (NON-SEMESTER EXAMINATIONS)

SECOND YEAR (Regulation 2009-2010)

PAPER II – PHARMACEUTICAL ANALYSIS & PHYSICAL CHEMISTRY

Q.P. Code: 564257

Time: Three hours

Answer ALL questions

Maximum: 100 Marks

**SECTION-A
(PHARMACEUTICAL ANALYSIS)**

I. Elaborate on: **(1 x 20 = 20)**

1. a) Explain briefly about various steps involved in gravimetric analysis by illustrating the determination of Magnesium as magnesium pyrophosphate.
b) Discuss about various methods of end point detection in Complexometric titrations.

II. Write notes on: **(4 x 5 = 20)**

1. Discuss briefly on Henderson-Hasselbalch equation.
2. Brief out on the types of Errors.
3. Illustrate the preparation and standardization of tetrabutyl ammonium hydroxide.
4. Write a note on redox indicators.

III. Short answers on: **(5 x 2 = 10)**

1. Accuracy & Precision.
2. Leveling effect.
3. Diazotization titration.
4. Acid value & Iodine value.
5. Mercurimetric titration.

**SECTION-B
(PHYSICAL CHEMISTRY)**

I. Elaborate on: **(1 x 20 = 20)**

1. a) Define order of reaction. Explain various methods for determining the order of reaction.
b) Elaborate briefly on the Principle, Instrumentation and Applications of polarimeter.

II. Write notes on: **(4 x 5 = 20)**

1. Define solution. Write a note on the types of Solution.
2. Describe the working of a Carnot cycle.
3. Explain Hess's law of constant heat of summation.
4. Write a note on phase transfer catalysts.

III. Short answers on: **(5 x 2 = 10)**

1. Ideal and real solutions.
2. Enthalpy of combustion.
3. Types of adsorption isotherms.
4. Enzyme catalysts.
5. Concept of activation energy.

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[BPHARM 0522]

**MAY 2022
(FEBRUARY 2022 EXAM SESSION)**

Sub. Code: 4257

**B. PHARMACY DEGREE EXAMINATION
SECOND YEAR – (NON-SEMESTER)
PAPER II – PHARMACEUTICAL ANALYSIS & PHYSICAL CHEMISTRY
Q.P. Code: 564257**

Time: Three hours

Answer ALL questions

Maximum: 100 Marks

**SECTION-A
(PHARMACEUTICAL ANALYSIS)**

I. Elaborate on: (1 x 20 = 20)

1. a) Explain the theory of Neutralization titrations. List out and explain various concepts of acid and base with examples.
b) Discuss about Henderson – Hasselbalch equation.

II. Write notes on: (4 x 5 = 20)

1. Discuss briefly on Common Ion effect and its application.
2. Brief out on the types of Errors.
3. Argentometric titration.
4. Analysis of oils, fats and waxes.

III. Short answers on: (5 x 2 = 10)

1. Accuracy & Precision.
2. Oxygen flask combustion.
3. Iodimetry.
4. Co- Precipitation.
5. Masking and Demasking agents.

**SECTION-B
(PHYSICAL CHEMISTRY)**

I. Elaborate on: (1 x 20 = 20)

1. a) Explain about colligative properties of solutions with examples.
b) Discuss about Henry's law.

II. Write notes on: (4 x 5 = 20)

1. Heat of reaction.
2. Describe the working of a Carnot cycle.
3. Determination method of orders of reaction.
4. Write a note on phase transfer catalysts.

III. Short answers on: (5 x 2 = 10)

1. Entropy.
2. Refractive index.
3. Velocity constant.
4. Enzyme catalysts.
5. Third law of Thermodynamics.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[BPHARM 1022]

OCTOBER 2022

Sub. Code: 4257

(AUGUST 2022 EXAM SESSION)

B.PHARMACY DEGREE COURSE (NON-SEMESTER EXAMINATIONS)

SECOND YEAR (Regulation 2009-2010)

PAPER II – PHARMACEUTICAL ANALYSIS AND PHYSICAL CHEMISTRY

Q.P. Code: 564257

Time: Three hours

Answer ALL questions

Maximum: 100 Marks

**SECTION-A
(PHARMACEUTICAL ANALYSIS)**

I. Elaborate on: (1 x 20 = 20)

1. a) Describe the types of complexometric titration with suitable examples.
b) Discuss in detail about diazotization titration.

II. Write notes on: (4 x 5 = 20)

1. Discuss about kjeldahl method for nitrogen estimation.
2. Write note on normal distribution curve.
3. Describe buffer mechanism with example.
4. Explain gay lussac stas method.

III. Short answers on: (5 x 2 = 10)

1. What is Nernst Equation?
2. Define saponification value.
3. What is iodometry? Give example.
4. What is gravimetric analysis?
5. List out types of solvents in non aqueous titration.

**SECTION-B
(PHYSICAL CHEMISTRY)**

I. Elaborate on: (1 x 20 = 20)

1. a) State phase rule and explain the application of phase rule in one component system.
b) Define order of reaction and derive the equation for second order reaction.

II. Write notes on: (4 x 5 = 20)

1. Explain the following
a) Enthalpy of solution b) Enthalpy of precipitation.
2. Summarize the characteristics of catalyst.
3. Types of adsorption with example.
4. Explain partition coefficient with limitations.

III. Short answers on: (5 x 2 = 10)

1. Define degree of freedom.
2. Define bond energy. Give example.
3. Define adsorption isotherm.
4. What is plane polarized light?
5. Define rate of reaction.

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[B.PHARM 0323]

**MARCH 2023
(FEBRUARY 2023 EXAM SESSION)**

Sub. Code: 4257

B.PHARMACY DEGREE COURSE (NON-SEMESTER EXAMINATIONS)

SECOND YEAR (Regulation 2009-2010)

PAPER II – PHARMACEUTICAL ANALYSIS AND PHYSICAL CHEMISTRY

Q.P. Code: 564257

Time: Three hours

Answer ALL questions

Maximum: 100 Marks

**SECTION-A
(PHARMACEUTICAL ANALYSIS)**

I. Elaborate on: (1 x 20 = 20)

1. a) Describe briefly about theories of redox titration.
b) Explain in detail about masking and demasking with examples.

II. Write notes on: (4 x 5 = 20)

1. Explain about calibration of volumetric apparatus.
2. How will you prepare and standardize 0.1M perchloric acid?
3. Mohr's method with limitations.
4. Discuss about Co and post precipitation.

III. Short answers on: (5 x 2 = 10)

1. What is universal indicator?
2. Explain Fajan's method.
3. Define buffer.
4. List out redox indicator with examples.
5. Define refractive index.

**SECTION-B
(PHYSICAL CHEMISTRY)**

I. Elaborate on: (1 x 20 = 20)

1. a) State and explain First Law of Thermodynamics.
b) Discuss in detail about the Joule-Thomson effect.

II. Write notes on: (4 x 5 = 20)

1. Explain the following
a) Molar heat capacity b) Chemisorptions.
2. Describe Debye Huckel theory.
3. Discuss in detail about mechanism of catalysis.
4. State and derive first order reaction.

III. Short answers on: (5 x 2 = 10)

1. Define partition coefficient.
2. Define adsorption isotherm.
3. What is biocatalyst?
4. Define order of reaction.
5. Define enthalpy of neutralization.

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[B.PHARM 0823]

AUGUST 2023

Sub. Code: 4257

**B.PHARMACY DEGREE COURSE (NON-SEMESTER EXAMINATIONS)
SECOND YEAR (Regulation 2009-2010)
PAPER II – PHARMACEUTICAL ANALYSIS AND PHYSICAL CHEMISTRY**

Q.P. Code: 564257

Time: Three hours

Answer ALL questions

Maximum: 100 Marks

**SECTION-A
(PHARMACEUTICAL ANALYSIS)**

I. Elaborate on: (1 x 20 = 20)

1. a) Explain in detail about theory of acid-base indicators.
b) Give an account on neutralization curves.

II. Write notes on: (4 x 5 = 20)

1. Write notes on calibration of volumetric apparatus.
2. What is Gasometry? Give the procedure for the assay of oxygen.
3. pM indicators.
4. What are precipitation titrations? Explain Volhard's method.

III. Short answers on: (5 x 2 = 10)

1. What are organic precipitants?
2. Why is magnesium sulphate added in the assay of calcium gluconate?
3. Define Redox indicators and give examples.
4. What are the precautions to be taken during the preparation of perchloric acid?
5. Define Saponification value and give its importance.

**SECTION-B
(PHYSICAL CHEMISTRY)**

I. Elaborate on: (1 x 20 = 20)

1. a) Define Colligative properties. Explain any one method of determination of lowering of vapour pressure.
b) Explain Joule Thomson effect.

II. Write notes on: (4 x 5 = 20)

1. Methods of determination of order of a reaction.
2. First law of thermodynamics.
3. Define Adsorption and explain its applications in Pharmacy.
4. Explain the Theory of catalysis.

III. Short answers on: (5 x 2 = 10)

1. Define molecularity of a reaction.
2. Define enthalpy of combustion.
3. What are phase transfer catalysts?
4. Define Refractive index.
5. The rate constant of a first order reaction at 25⁰C is 0.4505⁻¹. What is the half-life of the reaction?

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[B.PHARM 0524]

**MAY 2024
(FEBRUARY 2024 EXAM SESSION)**

Sub. Code: 4257

**B.PHARMACY DEGREE COURSE (NON-SEMESTER EXAMINATIONS)
SECOND YEAR (Regulation 2009-2010)
PAPER II – PHARMACEUTICAL ANALYSIS AND PHYSICAL CHEMISTRY
Q.P. Code: 564257**

Time: Three hours

Answer ALL questions

Maximum: 100 Marks

**SECTION-A
(PHARMACEUTICAL ANALYSIS)**

I. Elaborate on: (1 x 20 = 20)

1. a) Define error. Explain the types and minimization of error.
b) Discuss in detail about theories of indicator in neutralization titration.

II. Write notes on: (4 x 5 = 20)

1. Describe types of solvent used in non aqueous titration.
2. Explain volhards method with example.
3. How will you prepare and standardize 0.02M potassium permanganate?
4. Explain oxygen combustion flask method.

III. Short answers on: (5 x 2 = 10)

1. Define post precipitation.
2. What is significant figure?
3. Define pH.
4. What is Iodimetry?
5. Define complexation.

**SECTION-B
(PHYSICAL CHEMISTRY)**

I. Elaborate on: (1 x 20 = 20)

1. a) Explain briefly about types of adsorption isotherm.
b) Elaborate on the construction, principle of operation and applications of Refractometer.

II. Write notes on: (4 x 5 = 20)

1. State and explain second law of thermodynamics.
2. Explain types of catalysis.
3. Explain the factors influencing adsorption.
4. Define internal energy and enthalpy. Give relation between ΔH and ΔE .

III. Short answers on: (5 x 2 = 10)

1. Define solution with example.
2. What is spontaneous process?
3. Define catalyst.
4. Define order of reaction.
5. State Lavoisier Laplace Law.

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[B.PHARM 1024]

**OCTOBER 2024
(AUGUST 2024 EXAM SESSION)**

Sub. Code: 4257

**B. PHARMACY DEGREE COURSE (NON-SEMESTER EXAMINATIONS)
SECOND YEAR (Regulation 2009-2010)
PAPER II – PHARMACEUTICAL ANALYSIS AND PHYSICAL CHEMISTRY**

Q.P. Code: 564257

Time: Three hours

Answer ALL questions

Maximum: 100 Marks

**SECTION-A
(PHARMACEUTICAL ANALYSIS)**

I. Elaborate on: (1 x 20 = 20)

1. a) What is Gravimetric Analysis? List out and explain various types involve in that with suitable example.
- b) Differentiate Co-Precipitation and Post- Precipitation.
- c) How do you minimize Post – Precipitation.

II. Write notes on: (4 x 5 = 20)

1. Preparation and standardisation of 0.1M sodiumthiosulphate.
2. Define buffer solution. Write its types and application in Pharmacy.
3. Explain oxygen flask combustion method for the determination of Chloride.
4. Explain Adsorption indicator with examples.

III. Short answers on: (5 x 2 = 10)

1. Name the indicators in Complexometric titration.
2. Determination of Nitrogen content.
3. Define Rancidity.
4. Define Accuracy.
5. Define Mercurimetric titration.

**SECTION-B
(PHYSICAL CHEMISTRY)**

I. Elaborate on: (1 x 20 = 20)

1. a) Define Distribution Law. What are the various methods to determine partition coefficient.
- b) What is solution? Classify them with example.
- c) What is solubility? Explain various factors influence the solubility.

II. Write notes on: (4 x 5 = 20)

1. Define enthalpy and entropy. Write the relation between delta H and delta E.
2. Write a note on measurement of heat of reaction.
3. Define adsorption isotherm. Explain about Gibb's adsorption isotherm.
4. Biocatalyst and activation energy.

III. Short answers on: (5 x 2 = 10)

1. Velocity constant.
2. Plane polarized light.
3. Specific refraction.
4. Hendry's law.
5. Phase Rule.
