

IIIV B.PHARMACY (1st & 2nd SEMESTERS)
201 PHARMACEUTICS - I (Theory) (75 hrs)

Unit : 01

History of Pharmacy : Pharmacy Profession, Pharmacy as a career, Evolution of Pharmacy- Pharmacopoeia of India and other Countries, B.P., B.P.C., USP

Metrology : Systems of weights and measures, Metric and Imperial systems; Percentage calculations and adjustment of products; Interconversions; Use of alligation method in calculations; Isotonic solutions and proof spirits. Weighing - selection and care of weights and balances.

Packaging and Labelling of pharmaceuticals: Desirable features of containers, Types of containers and study of Glass and plastics as materials for containers and rubber as material for closures, their merits and demerits and labelling requirements.

Unit : 02

Introduction to Dosage Forms- Classification, Types with examples, Definitions and essential Characteristics of Different dosage forms; Formulation and its purpose. Formulation Additives : Solvents, Vehicles for Liquids, Antioxidants, Preservatives, Coloring agents, sweetening and flavoring agents in Liquid dosage forms.

Unit : 03

Liquid Oral Dosage Forms : Definitions, General formulation, methods of preparation, uses of Official and other products in common usage of the following : Solutions, Aromatic waters, Spirits, Syrups, Elixirs, Dry Syrups, Mixtures

Unit : 04

Monophonic Liquids for external and other uses : Definitions, general formulation, methods of preparation, uses of official and other products in common usage of the following: Lotions, Liniments, Throat paints, gargles, mouthwashes, glycerins, collodions, Ear Drops, Nasal drops and sprays, Douches

Biphasic Liquid dosage Forms: Suspensions – Definitions, Types, ideal requirements, Formulation additives, Typical examples for Oral and external use, Methods of preparation.

Unit : 05

Galenicals : Study of extraction processes; Maceration, percolation and their modifications, continuous hot extraction, their applications. Principles and methods of preparations of dry, soft and liquid extracts and tinctures of I.P and B.P (Latest Editions).

Suppositories and pessaries : Ideal requirements, Different Bases, Preparation methods - Typical examples, Calculations involving displacement value, Packaging and Supply.

Unit : 06

Incompatibility : Physical, Chemical and therapeutic incompatibilities- Methods of over coming and handling of incompatible prescriptions.

IIIV B.PHARMACY (1st & 2nd SEMESTERS)
202 PHARMACEUTICS-I (General Pharmacy)
(Practicals) (75 hrs.)

Preparation of the following classes of dosage forms.

AROMATIC WATERS

01. Chloroform water I.P.
02. Cinnamon water
03. Camphor water
04. Peppermint water

SOLUTIONS

05. Aqueous iodine solution (Lugol's solution)
06. Strong iodine solution I.P. (Strong tincture of iodine)
07. Weak iodine solution I.P. (Tincture of iodine)
08. Strong ammonium acetate solution.
- 09*. Surgical solution of chlorinated soda (Dakin's solution)
- 10*. Cresol with soap solution I.P. (Lysol solution)

SYRUPS

11. Syrup
12. Citric acid syrup USP
13. Codeine phosphate syrup
- 14*. Compound ferrous phosphate syrup

ELIXIRS

15. Compound benzaldehyde elixir
16. Terpin hydrate elixir

LOTIONS

17. Copper and zinc Sulphate lotion BPC
18. Sodium thiosulphate lotion
- 19*. Calamine lotion
20. Benzyl benzoate lotion
21. Lime cream (Oily calamine lotion)

LINIMENTS

22. Camphor liniment (Camphorated oil)
23. Turpentine liniment

GARGLES

24. Phenol gargle BPC

MOUTH WASHES

25. Phenol and alkali mouth wash
26. Compound sodium chloride mouth wash

THROAT PAINTS

27. Compound iodine paint (Mandl's throat paint)

DOUCHES

28. Solution of alum (Vaginal douche)
29. Potassium permanganate solution BPC

EAR DROPS

31. Hydrogen peroxide ear drops BPC
32. Sodium bicarbonate ear drops
33. Phenol ear drops

NASAL DROPS

34. Ephedrine hydrochloride nasal drops.

GLYCERITES

35. Phenol glycerin
36. Borax glycerin
37. Starch glycerin
38. Tannic acid glycerin

SUSPENSIONS

39. Magnesium carbonate suspension BPC
40. Magnesium trisilicate suspension BPC
41. Paediatric chalk mixture
- 42*. Magnesium hydroxide suspension IP (Milk of magnesia)
- 43*. Liquid paraffin emulsion
- 44*. Calciferol emulsion
- 45*. Castor oil emulsion
46. Castor oil enema (Emulsion)

SUPPOSITORIES :

- 47*. Glycero-gelatin suppositories
48. Crystal violet pessaries

TEXT BOOKS :

01. Bentley's Text book of Pharmaceutics.
02. Introduction to Pharmaceutical Dosage Forms by H.C.Ansel
03. Cooper and Gunn's – Dispensing for Pharmaceutical Students
04. American Pharmacy by Sprowls
05. I.P. 3rd Edition
06. Remington's Pharmaceutical Sciences.
07. General Pharmacy and Professional Pharmacy by M.L.Schroff.

IIIV B.PHARMACY (1st & 2nd SEMESTERS)

MODEL QUESTION PAPER

201 PHARMACEUTICS - I (Theory)

Time : 3 hours

Max.Marks : 80

SECTION - I

Answer any four questions (4 X 10 = 40 marks)

1. What are the desirable features of containers and closures ?
Explain about plastic containers ?
2. Classify various pharmaceutical dosage forms with suitable examples
3. Explain the methods for preparing syrups. Describe the preparation of compound ferrous phosphate syrup ?
4. What are suspensions ? Mention various suspending agents and write preparation of suspensions ?
5. What are the salient differences between maceration, percolation and hot continuous percolation ? Explain about maceration
6. Define the term incompatibility . What are different types of incompatibilities ? Explain about chemical incompatibility

SECTION - II

Answer any TEN questions (10 x 4 = 40 marks)

7. Explain about alligation method. Calculate the volumes of 30%, 40% and 60% v/v alcohol required to prepare 300 ml of 50% v/v alcohol.
8. Explain the evaluation of I.P.
9. Write a short notes on preservatives.
10. Write about preparation of purified water.
11. Write down the principle and procedure involved in the preparation of aromatic spirit of Ammonia.
12. Explain about milk of magnesia
13. Describe the process of decoction and infusion.
14. Write a note on displacement value
15. Write down the principle involved in the preparation of mandle's paint.
16. Describe the method of preparation of dry syrups.
17. Explain about therapeutic incompatibility
18. Identify the incompatibility and suggest suitable method of dispensing for the following prescription.

Rx Quinine sulphate : 1.5 gm
Dil. Sulphuric acid : 4 ml
Potassium Iodide : 8 gm
Water : 200 ml

Make a mixture.

IIIV B.PHARMACY (1st & 2nd SEMESTERS)

MODEL QUESTION PAPER (Practical)

202 PHARMACEUTICS-I (General Pharmacy)

Time : 4 hours

Max.Marks : 80

1. Synopsis : 10 Marks
- 2* Major Experiment : 35 Marks
3. Minor Experiment : 20 Marks
4. Viva-Voce : 15 Marks

Total: 80 Marks

IIIV B.PHARMACY (1st & 2nd SEMESTERS)

203 PHARMACEUTICAL ANALYSIS-I (Theory) (75 hrs.)

Unit : 01

Balances : Different types and weighing, types of analysis, obtaining sample, measurement of sample and types of pipettes. Computation of Analytical Results: Significant numbers, sources of errors and their rectification, statistical treatment of the data and rejection of data. Ionic equations of solutions, stoichiometric and analytical problems; Determination of Normality, percentage purity, Molarity, Molality and their inter conversions.

Unit : 02

Impurities in Pharmaceuticals and Limit tests : Sources and effects of impurities in pharmacopoeial substances, importance of limit test, general principles and procedures for limit tests for chloride, sulphate, iron, arsenic, lead and heavy metals. Special procedures for limit tests.

Unit : 03

Principles of Volumetric and Gravimetric Analysis : Standardization; Use of primary and secondary standards. Acid base concept, common ion effect and solubility product, p^H and buffers. General principles and theory of acidimetry, alkalimetry, Oxidation, reduction methods, precipitation methods. An account of the indicators used in these titrations. Diazotisation titrations.

Unit : 04

Gravimetric methods : Typical methods involving precipitation, coagulation, incineration or digestion procedures.

Unit : 05

Complexometric titrations : Theory, types and application in pharmaceutical analysis. Masking and demasking agent and its application.

Non-aqueous Titrations : Theory, types and applications in pharmaceutical Analysis

Unit : 06

Determination of moisture content and alcohol content, theory and methods involved.

Good Laboratory Practices: Introduction to good laboratory practices. Importance of GLP in analysis of pharmaceuticals Principle of gas Analysis

IIIV B.PHARMACY (1st & 2nd SEMESTERS)

204 PHARMACEUTICAL ANALYSIS

(Practicals) (75 hrs.)

I-ACID-BASE TITRATIONS

01. Standardization of hydrochloric acid
02. Standardization of sodium hydroxide
03. Assay of sodium bicarbonate
- 04*. Assay of borax
05. Assay of ammonium chloride
- 06*. Assay of boric acid
- 07*. Assay of zinc oxide

II-REDOX TITRATIONS

- 08*. Assay of ferrous ammonium sulphate (Mohr's salt)
09. Assay of hydrogen peroxide solution
- 10*. Assay of copper sulphate

III-COMPLEXOMETRIC TITRATIONS

11. Assay of calcium lactate
- 12*. Assay of magnesium sulphate

IV-ANALYSIS OF PHARMACEUTICAL DOSAGE FORMS

13. Estimation of nalidixic acid in nalidixic acid oral suspension
14. Estimation of calcium gluconate in calcium gluconate injection.

V-LIMIT TESTS

15. Limit test for chlorides
16. Limit test for sulphates
17. Limit test for iron
- 18*. Limit test for arsenic

TEXT BOOKS :

01. Quantitative Inorganic Analysis by A.I.Vogel
02. Bentley and Driver – Text book of Pharmaceutical Chemistry
03. Practical Pharmaceutical Chemistry – A.H.Backett and J.B.Stenlake
04. Indian Pharmacopoeia
05. Quantitative Pharmaceutical Chemistry by Chatten.
06. Quantitative analysis by R.A.Day and A.L.Underwood.
07. Pharmaceutical analysis by P.C.Kamboj

IIIV B.PHARMACY (1st & 2nd SEMESTERS)
MODEL QUESTION PAPER
203 PHARMACEUTICAL ANALYSIS - I (Theory)

Time : 3 hours

Max.Marks : 80

SECTION - A

Answer any FOUR questions

(4 x 10 = 40 marks)

1. What is Error ? Classify them. Give the sources of errors in analysis. How do you rectify them
2. Write in detail about "sources of impurities in Pharmaceuticals" ?
3. Explain the different theories of acid-base indicators in detail ?
4. Discuss various steps involved in a gravimetric method of analysis
5. Explain the different types of complexometric titrations in detail with suitable examples.
6. How do you estimate the content of moisture in a given sample by chemical method ?

SECTION - B

Answer any TEN questions

(10 x 4 = 40 marks)

7. What are the methods of weighing a sample in a balance ?
8. How do you minimise method errors ?
9. Give the principle involved in limit test for chlorides
10. Write procedure for limit test for Arsenic ?
11. What is a primary standard ? Explain ideal properties expected of it ?
12. Write notes on Fajan's method.
13. What is co-precipitation ? How do you minimise it ?
14. Write the filter media employed in gravimetry.
15. What are masking and densiting agents. Give two examples.
16. Explain how 0.1N perchloric acid prepared and standardised ?
17. Write the estimation of alcohol content by distillation method
18. Mention the applications of good laboratory practices in pharmaceutical analysis

IIIV B.PHARMACY (1st & 2nd SEMESTERS)

MODEL QUESTION PAPER (Practicals)

204 PHARMACEUTICAL ANALYSIS

Time : 4 hours

Max.Marks : 80

- | | | |
|---------------------|---|----------|
| 1. Synopsis | : | 10 Marks |
| 2* Major Experiment | : | 35 Marks |
| 3. Minor Experiment | : | 20 Marks |
| 4. Viva-Voce | : | 15 Marks |

Total: -----
80 Marks

IIIV B.PHARMACY (1st & 2nd SEMESTER)
205 ENVIRONMENTAL STUDIES (Theory) (75 hrs.)

Unit : 01

Module 1: Introduction

- Definition, scope and importance
- Measuring and defining environment development : indicators

Module 2: Ecosystems

- Introduction, types, characteristic features, structure and functions of Ecosystems
- Forest
- Grassland
- Desert
- Aquatic (lakes, rivers, and estuaries)

Module 3: Environment and Natural Resources Management

Land Resources

- Land as a resource
- Common property resources
- Land degradation
- Soil erosion and desertification
- Effects of modern agriculture, fertilizer-pesticide problems,

Forest resources

- Use and over-exploitation
- Mining and dams – their effects on forest and tribal people

Water resources

- Use and over-utilization of surface and ground water
- Floods, droughts
- Water logging and salinity
- Dams – benefits and costs
- Conflicts over water

Energy resources

- Energy needs
- Renewable and non – renewable energy sources
- Use of alternate energy sources
- Impact of energy use on environment

Unit : 02

Module 4: Bio – diversity and its conservation

- Value of bio-diversity - consumptive and productive use, social, ethical, aesthetic and option values.
- Bio-geographical classification of India – India as a mega diversity habitat.
- Threats to biodiversity – Hot spots, habitat loss, poaching of wildlife, loss of species, seeds, etc.
- Conservation of bio-diversity, In-situ and Ex-situ conservation

Unit : 03

Module 5: Environmental pollution – Local and Global Issues

- Causes, effects and control measures of
- Air pollution
- Indoor air pollution
- Water pollution
- Soil pollution
- Marine Pollution
- Noise pollution
- Solid waste management, composting, vermiculture
- Urban and industrial wastes, recycling and re-use.
- Nature of thermal pollution and nuclear hazards
- Global Warming
- Acid Rain
- Ozone layer depletion

Module 6: Environmental Problems in India

- Drinking water, Sanitation and public health
- Effects of activities on the quality of environment
 - * Urbanization
 - * Transportation
 - * Industrialization
 - * Green revolution
- Water scarcity and Ground Water depletion
- Controversies on major dams, - resettlement and rehabilitation of people: Problems and concerns
- Rain water harvesting, cloud seeding and watershed management

Unit : 04

Module 7: Economy and Environment

- The economy and environment interaction
- Economics of development, preservation and conservation
- Sustainability; theory and practice
- Limits to Growth
- Equitable use of resources for sustainable lifestyles
- Environmental Impact Assessment

Module 8: Social Issues and the Environment

- Population growth and environment
- Environmental education
- Environmental movements
- Environment vs Development

Unit : 05

Module 9: Institutions and Governance

- Regulation by Government
- Monitoring and Enforcement of Environmental regulation
- Environmental Acts
 - Water (Prevention and Control of pollution) act
 - Air (Prevention and Control of pollution) act
 - Envt. Protection act
 - Wild life Protection act
 - Forest Conservation act
 - Coastal Zone Regulations
- Institutions and policies relating to India
- Environmental Governance

Module 10: International Conventions

- Stockholm Conference 1972
- Earth Summit 1992
- World Commission for Environmental Development (WCED)

Unit : 06

Module 11: Case Studies

- Chipko movement
- Narmada Bachao Andolan
- Silent Valley project
- Madhura Refinery and Taj Mahal
- Industrilisation of Pattancheru
- Nuclear reactor at Nagarjuna Sagar
- Tehri Dam
- Relegan Siddhi (Anna Hazare)
- Kolleru lake – aquaculture
- Fluorosis in Andhra pradesh

Module 12: Field work

- Visit to a local area to document and mapping environmental assets
 - river/ forest/ grass land/ hill/ mountain
- Study of local environment – common plants, insects, birds
- Study of simple ecosystems – pond, river, hill, slopes etc.
- Visits to Industries, Water treatment Plants, Effluent treatment plants.

TEXT BOOKS :

1. Introduction to Environmental sciences by Y.Anjaneyulu,
2. Environmental sciences by Dr.U.Sai Jyothi.
3. A text book of Environmental science by Aravind Kumar
4. A text book of Environmental sciences by Purohit, Shammi, Agrawal
5. Environmental sciences by Kaushik
6. Principles of Environmental studies by C.Manoharachary & P.Jayarama Reddy.
7. Ecology and Environment by P.D.Sharma.
8. Environmental studies (for U.G.) - J.P.Sharma

IIIV B.PHARMACY (1st & 2nd SEMESTER)

MODEL QUESTION PAPER

205 ENVIRONMENTAL STUDIES (Theory)

Time : 3 hours

Max.Marks : 80

SECTION - A

Answer any FOUR questions

(4 X 10 = 40 marks)

1. Write an essay on structure and function of any one ecosystem.
2. Why bio diversity is so important. Delimate clearly the threats to bio diversity
3. Write in detail about causes, effects and control measures of water pollution.
4. Narrate the concept of sustainable development.
5. Write the role of regulatory and non governmental organizations in environmental protection.
6. Write notes on (i) Chipko movement (ii) Fluorosis in Andhra Pradesh

SECTION - B

Answer any TEN questions

(10 x 4 = 40 marks)

7. Explain the role of decomposers.
8. Write notes on soil erosion.
9. Explain values of bio-diversity.
10. Write notes on conservation of bio-diversity.
11. Explain the consequences of global warming.
12. Discuss the environmental problems associated with urbanization.
13. Discuss non formal environmental education.
14. What is population explosion ? How it effects environment ? Explain briefly.
15. Explain wild life protection act.
16. Write notes on significance of stockholm conference 1972.
17. Explain about Nuclear reactor at Nagarjuna Sagar.
18. Write on Narmada Bachao Andolan.

A.N.U. B.PHARMACY SYLLABUS (WITH EFFECT FROM 2008 - 09 ACADEMIC YEAR)



**IIIIIV B.PHARMACY
6th SEMESTERS**

ACHARYA NAGARJUNA UNIVERSITY