

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

101 A MATHEMATICS (75 hrs.)

Unit : 01

ALGEBRA: Arithmetic progression-Geometric Progression-Permutations and Combinations-Binomial theorem-Partial functions-Matrices- Determinants-Application of determinants to solve simultaneous equations (Cramer's Rule)

Unit : 02

CO- ORDINATE GEOMETRY: Distances between two points – Area of a Triangle, Co-ordinates of a point dividing a given segment in a given ratio-locus-equation to a straight line in different forms –Angle between straight lines –Point of intersection.

Unit : 03

DIFFERENTIAL CALCULUS:

Limit of a function, derivative of a function, Differentiation of a sum, Product and quotient, Differentiation of composite functions, Implicit functions, parametric functions, Logarithmic differentiation, differentiation of exponentials.

Unit : 04

CONTINUITY AND LIMIT: Differentiation, derivability and derivative, R.H. derivatives and L.H. derivatives, differentiations. General theorems of derivation. Derivatives of trigonometric functions (excluding inverse trigonometric and hyperbolic functions). Logarithmic differentiation. Partial differentiation maxima and minima (elementary)

Unit : 05

INTEGRAL CALCULUS: Integration as inverse process of differentiation, definite integrate integration by substitution, integration by parts, integration of Algebraic function of evaluation of area in simple cases.

Unit : 06

DIFFERENTIAL EQUATIONS: Formation of differential equation, order and degree, derivation of a differential equation.Introduction to Laplace transforms and their use.

TEXT BOOKS

- | | | |
|--|---|--|
| 1. Differential Calculus | : | Shantinarayan |
| 2. Integral Calculus | : | Shantinarayan |
| 3. Engineering Mathematics | : | Grewaf |
| 4. Intermediate Mathematics | : | V.Venkateswara Rao
N.Krishnamurthy
B.V.S.S.Sarma |
| 5. Differential Equations and their applications | : | Jafar Ahsan |

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

MODEL QUESTION PAPER

101 A MATHEMATICS

Time : 3 hours

Max.Marks : 80

SECTION - A

Answer any four questions

(4 X 10 = 40 marks)

1. If $\begin{vmatrix} (a+b)^2 & ca & bc \\ ca & (b+c)^2 & ab \\ bc & ab & (c+a)^2 \end{vmatrix} = k abc (a + b + c)^3$ then find the value of K.

2.a. Find the equation of the straight line passing through the point of intersection of the lines $x + y + 1 = 0$, $2x - y + 5 = 0$ and through the point (5, -2)

b. Show that the points (1, 2) (-3, 4) (7, -1) are collinear.

3. If $x = a(1 + \sin\theta)$, $y = b(\theta - \cos\theta)$, then find (dy/dx) at $\theta = \pi/4$

4. Suppose that $f(x) = (1 - \cos ax)/(x \sin x)$, $x \neq 0$ and $f(0) = 1/2$
If f is continuous at $x = 0$, show that $a = \pm 1$

5.a. Evaluate $\int_0^{\pi/2} dx/(4+5\cos x)$

b) Evaluate $\int_0^{\pi} \sin x \sin 2x \sin 3x dx$

6. Solve : $3e^x \cos^2 y dx + (1 - e^x) \cot y dy = 0$

SECTION - B

Answer any TEN questions

(10 x 4 = 40 MARKS)

1. Find the sum to 'n' terms of the series $4 + 44 + 444 + \dots$

2. Resolve into partial fractions $1/(x(x^2+1))$

3. Find the area of triangle with vertices are (-1, 6), (-3, 9), (1, -3)

4. Find the locus of the point P such that $PA : PB = 3 : 1$ with $A = (4, 2)$ and $B = (-1, 5)$

5. Find the derivative of $\frac{\sin x + \cos x}{\sqrt{1+\sin 2x}}$

6. Find (dy/dx) if $y = x^x$

7. Find $\lim_{x \rightarrow \alpha} \frac{7x^3 - 8x^2 + 3}{2x^3 + 10x^2 - 20}$

8. Find $\lim_{x \rightarrow 0} \frac{\sqrt{1+x+x^2} - 1}{x}$

9. Evaluate $\int \cos^7 x dx$

10. Find the area bounded by the curves $y^2 = x$ and the line $x = 4$

11. Solve $(dy/dx) + \frac{\sqrt{1+y^2}}{\sqrt{1+x^2}} = 0$

12. Find the Laplace transform of $f(t) = \sin 2t \sin 3t$

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

101 B BIOLOGY (Theory) (50 hrs.)

Unit : 01

Living and non-living organisms and their differences, Plants and animals differences; Cell structure, Cell inclusions. Mitosis in animals and Meiosis in animals.

Unit : 02

Classification of plant kingdom and salient features of different groups only. Structure and life history of Bacteria and Yeast.

Unit : 03

Taxonomic Families : Solanaceae and Umbelliferae.

Unit : 04

Root (taproot and fibrous roots and their functions only), Stem, Leaf (Vegetative morphology), Flower, Inflorescence (Reproductive morphology), Anatomical structures of root, stem (Monocot and Dicot), Root and Fruit (Types of fruit); seed formation; pollination (different types of pollinating agents) and types of pollination methods.

Unit : 05

Classification of animal Kingdom; Invertebrates, vertebrates and their salient features only. Structure and physiology of Amoeba, Paramecium and Earthworm (locomotion, digestive, excretory and reproductive systems only).

Unit : 06

Parasitology: Introduction, Entamoeba, Plasmodium, Trypanosoma and Ascaris (Structure and Life history only).

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

101 C BIOLOGY (Practicals) (50 hrs.)

01. Care and use of the Microscope
02. Technical description of plants belonging to the Angiosperms families prescribed in the syllabus and referring them to their respective families.
03. Microscopic study of different tissues and the primary anatomical structure of a root, stem and leaf.(Monocot & Dicot)
04. Microscopic and macroscopic examination and identification of the types prescribed in the syllabus.
- 05*. Dissection in Earthworm, (Digestive & Nervous systems)

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

TEXT BOOKS

1. A class book of Botany : A.C.Dutta
2. Outlines of Zoology : Ekkambarnath Iyer
3. A text book of Vertebrate Zoology : S.N.Prasad
4. A text book of invertebrates : N.C.Nair
5. Intermediate Academy text books of Botany & Zoology

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

MODEL QUESTION PAPER

101B BIOLOGY (Theory)

Time : 3 hours

Max.Marks : 80

SECTION-A

Answer any four questions

(10 X 4 = 40 marks)

01. Explain in detail about Meiosis
02. Give a brief account of classification and salient features of various groups of plants.
03. Write the characteristic features and medicinal importance of plants belonging to the family solanaceae.
04. Describe the Morphological and anatomical character of dicot root.
05. Explain the structure and physiology of paramoecium.
06. Write in detail the structure and life history of malarial parasite.

SECTION - B

Answer any TEN questions

(4 X 10 = 40 Marks)

07. List out the differences between plants and animals.
08. Write a note on plastids
09. Write the salient features of Angiosperms
10. Explain the reproduction in Bacteria.
11. Discuss the economic and medicinal importance of plants belonging to the family solanaceae.
12. Describe the floral characters of umbelliferae with necessary diagrams and floral formula.
13. Write about racemose type of inflorescence.
14. Explain the fertilisation in plants.
15. Write about salient features of vertebrates.
16. Discuss the reproduction in Amoeba
17. Write about Muscular tissues of animals.
18. Write in brief about the life history of Trypanosoma.

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

MODEL QUESTION PAPER

101C BIOLOGY (Practicals)

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)
102 PHARMACEUTICAL CHEMISTRY-I (ORGANIC-I)
(Theory) (75 hrs.)

Unit : 01

Structure and Properties :

- Characteristic features of covalent bond, hydrogen bond, intermolecular forces, hybridisation.
- Reactive intermediates : Free radicals, carbocations and carbanions
- Electron displacement effects : Inductive effect, electromeric effect, resonance and hyperconjugation effects.
- Attacking reagents : Electrophiles and nucleophiles.

Unit : 02

Chemistry of Hydrocarbons :

- Nomenclature and general methods to prepare alkanes, alkenes, alkynes and cycloalkanes.
- Free radical chain reactions of alkanes - mechanism, relative reactivity and stability.
- Electrophilic addition : Reactions at carbon-carbon double bond, hydrogenation, Markovnikov's rule, addition of hydrogen halides, addition of hydrogen bromide, peroxide effect, electrophilic addition mechanism, cycloaddition, ozonolysis reactions, addition of carbenes to alkenes and glycol formation reaction.
- Addition of hydrogen halides and water to alkynes, polymerisation reaction and acidity of alkynes.
- Bayer's strain theory of strainless rings.
- Stability of conjugated dienes, mechanism of 1, 2 and 1, 4-additions with examples, effect of temperature on 1, 2 and 1, 4- addition to dienes.

Unit : 03

Chemistry of Alcohols and Ethers

- Nomenclature and general methods to prepare monohydric alcohols and ethers.
- Classification and isomerism in alcohols and ethers.
- Oxidation of alcohols, reaction of alcohols with metals and phosphorous trihalides and chemical tests to distinguish alcohols, dehydration of alcohols and its mechanism, orientation and reactivity in E2 and E1. reactions, Saytzeff's and Hoffmann's elimination.
- Brief account of absolute alcohol and Rectified spirit.
- Cleavage of ethers by acids, mechanism of Williamson's synthesis.

Unit : 04

Chemistry of alkyl halides :

- a. Nomenclature and general methods to prepare alkyl halides.
- b. Nucleophilic aliphatic substitution : Mechanism and stereochemistry of SN1 and SN2 reactions, SN2 vs SN1 reactions, reactivity of alkyl halides in SN1 and SN2 reactions and factors affecting SN1 and SN2 reaction.

Unit : 05

Chemistry of Carbonyl compounds :

- a. Classification, nomenclature and general methods to prepare carbonyl compounds
- b. Nucleophilic addition in aldehydes and ketones, mechanism with examples (addition of sodium bisulphite, hydrogen cyanide, alcohols, Grignard reagent and ammonia derivatives), Mechanism of Aldol condensation, crossed aldol condensation, cannizaro's reaction, reformatsky reaction, perkin reaction and Benzoin condensation.

Unit : 06

Chemistry of carboxylic acids and acid derivatives :

- a. Nomenclature and general methods to prepare carboxylic acids, acid chlorides, acid amides and esters.
- b. Nucleophilic acyl substitution in carboxylic acid derivatives, comparison with nucleophilic addition reaction, acidity of carboxylic acids, effect of substituents on acidity, HVZ reaction, conversion of acids to acid chlorides, amides, esters and anhydrides, acidic and alkaline hydrolysis of esters, esterification and Claisen condensation reactions.
- c. Preparation and synthetic uses of acetoacetic and malonic esters.

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

103 PHARMACEUTICAL CHEMISTRY – II (ORGANIC-I)

(Practicals) (75 hrs.)

01. Determination of melting point.
02. Determination of boiling point.
03. Demonstration of various filtration techniques.
04. Demonstration of various crystallisation techniques
05. Synthesis of benzoic acid by hydrolysis of Benzamide.
06. Synthesis of dibromo cinnamic acid from cinnamic acid.
07. Synthesis of dibenzal acetone from benzaldehyde
- 08*. Identification of organic compounds pertaining to phenols, amides, amines, carboxylic acids, aldehydes and ketones, alcohols, esters, hydrocarbons, nitro compounds and ethers by systematic qualitative organic analysis including preparation of derivatives.

TEXT-BOOKS :

01. R.T.Morrison and R.N.Boyd. 'Organic Chemistry'. Allyn and Bacon, In., Boston.
02. I.L.Finar, 'Organic Chemistry', Vol.1, the English Language Book Society, London.
03. B.S.Furniss, A.J.Hannaford, V.Rogers, P.W.G.Smith and A.H.Tatchell, Vogel's Text Book of Practical Organic Chemistry (Including qualitative organic analysis). The English Language Book Society.
04. Study guide to accompany the T.B. of organic chemistry by Morrison and Boyd-Morrison and Boyd.5
05. Problems and their solution in Organic Chemistry – I.L.Finar.
06. Rama Rao Nadendla, Principles of Pharmaceutical Organic Chemistry, MacMillan India Ltd., New Delhi.

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

MODEL QUESTION PAPER

102 PHARMACEUTICAL CHEMISTRY-I (ORGANIC-I) (Theory)

Time : 3 hours

Max.Marks : 80

SECTION-A

Answer any four questions

(4 X 10 = 40 marks)

1. What are carbocations ? Classify carbocations with examples ? Explain relative of formation and stability of Carbocations ?
2. What are cycloalkanes ? Write any three methods of their preparation and reactions.
3. Discuss the important methods to prepare monohydric alcohols.
4. Discuss the mechanism of SN reaction with a suitable example and support the same with evidence.
5. What are carbonyl compounds and how are they prepared ? Discuss the important nucleophilic reactions which they undergo
6. Discuss any three methods for the preparation of carboxylic acids ? Explain the effect of substituent groups on the acidity of carboxylic acids.

SECTION - B

Answer any TEN questions

(10 X 4 = 40 Marks)

7. Justify the statement - "Tertiary carbocation is more stable than methyl carbocation"
8. Write short notes on Resonance.
9. Explain 1, 2 and 1, 4- addition of Bromine to 1, 3-Butadiene
10. Write Markonikov's rule and anti-Markonikov's rule. Explain with suitable examples ?
11. How will you distinguish primary, secondary and tertiary alcohols ?
12. Write short notes on Hoffmann's elimination.
13. Describe any two methods for the preparation of alkyl halides ?
14. Why primary alkyl halides undergo only SN2 reaction ?
15. Give reason for the statement. "Benzaldehyde undergoes Cannizzaro reaction but not aldol condensation"
16. Write short notes on Perkin reaction ?
17. Acid chlorides are more reactive than simple carboxylic acids. Explain why.
18. Write short notes on HVZ reaction.

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

102 PHARMACEUTICAL CHEMISTRY-I (ORGANIC-I)

MODEL QUESTION PAPER (Practicals)

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)
104 PHYSICAL PHARMACY-I (Theory) (75 hrs.)

Unit : 01

Intermolecular forces and states of matter : Binding forces between molecules,

States of matter : Gaseous state , liquid state, solid state and crystalline state, phase equilibria and the phase rule.

Unit : 02

Thermodynamics : The first law of thermodynamics, thermo- chemistry, the second law of thermodynamics, the third law of thermodynamics, free energy functions and applications.

Unit : 03

Some physical properties of drug molecules: Dielectric constant, induced polarization, dipole moment, refractive index and molar refraction, optical rotation and optical dispersion.

Unit : 04

Solutions : Concentration expressions, solutions of nonelectrolytes, ideal and real solutions, colligative properties, molecular weight determinations.

Solutions of Electrolytes : Properties of solutions of electrolytes, the arrhenius theory of electrolytic dissociation, the modern theory of strong electrolytes and other coefficients for expressing colligative properties.

Unit : 05

Ionic Equilibria : Modern theories of acids, bases and salts, Sorensen's p^H scale, species concentration as a function of p^H , calculation of p^H , graphical solution of p^H problems, acidity constants .

Buffers and Buffered Isotonic systems : The buffer equation, buffer capacity, buffers in pharmaceutical and biological systems, buffered isotonic solutions, methods of adjusting tonicity and p^H

Unit : 06

Electromotive Forces and Oxidation-Reduction systems : Electro-chemical cells, electro metric determination of p^H and redox potentials.

Viscosity : Viscosity, poiseuille's formula for liquids, experimental determination of viscosity, ostwald viscometer, comparison of viscosities.

Photochemistry : Consequences of light absorption, Jablonski diagram, Lambert-Beer law and quantum efficiency.

IIIV B.PHARMACY (1st & 2nd SEMESTERS)
105 PHYSICAL PHARMACY - I (Practicals) (75 hrs.)

01. Determination of solubility of Salicylic acid
02. Determination of viscosity of given liquid.
- *03. Effect of temperature on viscosity
04. Determination of density of given solid
- *05. Determination of upper consolute temperature of phenol-water system
- *06. Effect of sodiumchloride on CST of phenol-water system.
07. Determination of surface tension.
08. Determination of interfacial tension.
09. Determination of dielectric constant and its relationship to solubility
10. Determination of optical activity.
11. Determination of pK_a of salicylic acid
12. Preparation of acetate buffer of pH 4
- *13. Determination of pK_a of acetic acid by graphical method.
14. Determination of Buffer capacity.

Text Books :

01. Physical Pharmacy by Alfred Martin
02. Bentley's Text book of Pharmaceutics by E.A.Rawlins.
03. Remington's Pharmaceutical Sciences.

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

MODEL QUESTION PAPER

104 PHYSICAL PHARMACY - I (Theory)

Time : 3 hours

Max.Marks : 80

SECTION - A

Answer any four questions

(4 X 10 = 40 marks)

01. With the help of a neat labelled diagram explain the phase diagram of phenol-water system. How is the tie line useful in calculating the composition of the conjugate layers.
02. State and explain first law of thermodynamics. How does the equation take different forms under different thermodynamic situations.
03. What are colligative properties. Derive an expression for calculation of molecular weight of non-volatile solute by freezing point depression method.
04. Explain the Arrhenius theory of electrolytic dissociation. Give its limitations.
05. What are iso osmotic, isotonic, hypertonic and hypotonic solutions. Discuss the various methods available for adjustment of tonicity of solutions.
06. With a neat labelled diagram explain the construction and working of Daniel cell. What is the role of the salt bridge and how does it prevent accumulation of charges at the electrodes.

SECTION - B

Answer any TEN questions

(10 X 4 = 40 marks)

07. What is polymorphism. Give its applications in pharmacy.
08. Write short notes on hydrogen bonding.
09. Distinguish between reversible and irreversible process.
10. What is entropy. How do you predict the spontaneity of a process using the concept of entropy.
11. Differentiate between ideal and real solution using suitable examples.
12. A sample of camphor used in the camphor rasi method had a melting point of 176.5°C. The melting point of a solid solution containing 0.522 g of camphor and 0.0386 g of drug was 160°C. Find the molecular weight of unknown drug substance. K_f of camphor is 37.7°C kg/mole.
13. State and explain Faraday's second law of electrolysis.
14. Write short notes on Vant Hoff factor for calculation of colligative properties of electrolyte solutions.
15. What is PBE equation. Give the rules for writing a proton balance equation.
16. Discuss the importance of buffers in pharmaceutical and biological systems.
17. Explain the principle involved in determination of viscosity of a liquid by Ostwald's viscometer.
18. Write short notes on Beer Lambert's law and its application in pharmacy

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

104 PHYSICAL PHARMACY - I

MODEL QUESTION PAPER (Practicals)

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)

106 COMPUTER APPLICATIONS AND STATISTICAL METHODS

(Theory) (75 hrs.)

Unit : 01

Introduction to computers development, computer types, characteristics, anatomy – input and output devices and other components – computer codes and arithmetic, flow chart, algorithm, languages.

BASIC Language : BASIC Program structure, constants, variables, expressions, LET, REM, STOP and END statements, input / output statements, control statements, additional statements, simple programme writing related to statistics.

Unit : 02

Introduction to DOS environment DOS usage

Fundamentals of BASIC Language: BASIC programmes, structure, loading and unloading, Basic Interpreter, Basic alphabet, constants, variables, operators, Expressions, hierarchy of operations.

Branching and Looping : IF-THEN, ELSE-GOTO, ON GOTO, GOSUB, ON GOSUB, WHILE – WEND, FOR-NEXT.

Arrays : Subscripted variable, single and multiple dimensions.

Graphs and sound : LINE, CIRCLE, DRAW, PSET, POINT, PAINT, PUT, GET, SOUND, PLAY etc.

Unit : 03

Introduction to C language : Development of C, Features, constants and variables, data types, operators and expressions, library functions,

I/O statements : Formatted and unformatted I/O, Scanf(), Printf(), getchar() and putchar() function.

Control structures : conditional and unconditional, IF, FOR, WHILE, SWITCH, BREAK and CONTINUE, GOTO statement. Application of Computers in Pharmacy

Unit : 04

Introduction to statistics, chance variations, collection, classification, graphical and pictorial representation of data, measures of central tendency and dispersion. Precision and Accuracy- Measures of Error.

Unit : 05

Probability, Normal and Binomial distributions, sampling distributions - standard error and Fiducial limits. t-test, chi-square test, F-test of significance - Principle involved and applications, analysis of variance (ANOVA).

Unit : 06

Correlation coefficient and Regression analysis – Method of least squares.

TEXT BOOKS :

01. Remington's Pharmaceutical Sciences.
02. Basic Computer Programming by Er.V.K.Jain
03. Biostatistics by Alwin L.Lewis
04. Computers and common sense - N.Hunt and J.Shelley.
05. Programming in "C" by E.Balaguru Swami.

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

MODEL QUESTION PAPER

106 COMPUTER APPLICATIONS AND STATISTICAL METHODS

Time : 3 hours

Max.Marks : 80

SECTION - A

Answer any four questions

(4 X 10 = 40 marks)

1. Explain the improvements made to computer systems in different generations.
2. Give the syntax and utility of the following statements in BASIC
 1. CIRCLE
 2. READ-DATA
 3. FOR-NEXT
 4. LOAD
3. Explain the control structures in "C" language
4. Explain in detail about the MEASURES OF CONTRAL TENDENCY with necessary formulae.
5. Define probability. Write properties and importance of Normal, Binomial distribution.
6. What is meant by correlation ?
What are positive and negative correlations ?
How coefficient of correlation obtained.

SECTION - B

Answer any TEN questions

(10 x 4 = 40 marks)

7. Explain the different sub units of a C.P.U
8. Write a program in BASIC to print the squares of first ten natural numbers.
9. Explain the use of the following MSDOS commands.
 - a. TREE
 - b. COPY CON
 - c. PROMPT
 - d. MD
10. Write about the arithmetic and their hierarchy. What are relational and logical operators ?
11. Write any four applications of computers in PHARMACY.
12. Explain Input statements of "C" language with examples.
13. Explain pictorial representation of data.
14. Define an error ? Write notes on different types of errors.
15. Define and explain chi-square distribution.
16. Define probability, random experiment and sample space.
17. Define regression. Give the two regression equations.
18. Explain Method of least squares and fit a straight line of the form $Y = a + bx$.