

M Phil- SYLLABUS

(For the candidates admitted from the academic year 2020-2021 onwards)

PAPER – I Research Methodology (Common for all Subjects except Languages)

Unit – I:

Methods and Technique. An introduction – Defining the research problem – What is a research problem?, Selecting the problem, Necessity of defining the problem, Technique involved in defining the problem, An illustration and conclusion. Research design – Meaning of research design, Need for research design, Features of good design, Important concepts of relating to research design, different research designs, Basic principles of experimental design and conclusion.

Unit – II:

Assignment and Thesis at the tertiary level: Writing at the tertiary level – assignments and term papers, thesis and dissertations, conventions of writing-the question of style. Planning the assignment – A time schedule, consulting source materials, preparing a work bibliography, taking notes, the outlines and the first draft. Planning the thesis – selecting a topic, reviewing the literature, designing the study and the chapter outline. Scholarly writing – a case study

Unit – III:

Writing the thesis or assignment: General format – preliminaries, the text, the reference material, the abstract and final product Page and Chapter format – chapter divisions and sub-divisions, spacing, pagination, margins, paragraph indentation and sample pages Tables and Figures – use of tables and figures, placement of tables and figures, Numbering of tables, numbering of pages, numbering of figures, table and figure captions, format of tables, format of figures, preparation of figures, foot notes to tables and figures, very large table and figures, pagination and margin, spacing and alignment, abbreviations and special symbols and numbers. Referencing – Reference systems, Essential informations, spacing capitalization and underline, alphabetical and chronological order, edited works and sum special cases.

Unit – IV:

Computer packages and Internet: Word Basics – Creating and working with documents – working with text and tables – Using Mail Merge. Using Excel: Working with worksheets – creating chart – working with Formula and Functions. Using Power Point: Working with power point – User Interfaces – Using templates and wizard (slide Presentation) - - Creating chart and Tables. Internet and World Wide Web (WWW) – Electronic Main (E-mail) – Intranet and Extranet.

Unit – V:

Descriptive statistics – tabulation, graphical representation – bar diagram – and pie diagrams – various measures of variance, measures of central tendency and normal distribution. Differential statistics “t” test, Chi – square test, “F” test (ANOVA) co - variance (ANCOVA) correlation and multiple regression analysis - Introduction to SPSS.

References:

- Thesis and Assignment writing by Janarthan Anderson and others – Wiley – Eastern Ltd, 1970. Part I Sections 1,2,3,4. Part II Sections 5,6,9,10.
- Research Methodology by C.R. Kothari, Chapter 1,2,3.
- Microsoft Office 2003 – Edward C. Willet. First Edition 2004, Wiley Publications, USA , (Chapters 2,3,4,5,6,12,14,15,26,28,29)

MPhil (2020-2021 Batch)

M Phil- SYLLABUS

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PAPER – II SPECTROSCOPIC METHODS (SUB CODE : 203CHC12)

UNIT –1

Electronic Spectroscopy: Energy states from spectral terms, Laporte and spin selection rules, Correlation diagrams, $d^1, d^9, d^6, d^4, d^2, d^8$ and d^3 ions, Orgel diagram, Racah parameters, spectra of d^5 ions, Tanabe-Sugano diagrams, Charge transfer spectra, Optically active complexes - cobalt and nickel. Applications to simple coordination compounds.

UNIT – II

IR Spectroscopy: Instrumentation, Vibrational motion of diatomic molecules, Vibration-rotation spectroscopy, P,Q,R branches, Factors influencing vibrational frequencies, Metal-ligand vibrations, Interpretation of an IR spectrum, Fingerprint region, Group frequencies, Alkane, Alkenes, Alkynes, Aldehyde, ketones, carboxylic acids, acid amides, amino acids, Isocyanates and Thiocyanates.

UNIT – III

NMR Spectroscopy: ^1H NMR Spectroscopy, Comparison of ^{13}C NMR and ^1H NMR, Chemical shift and its measurements, shielding and deshielding effects, Factors affecting chemical shift, types of carbons and their signals and splitting, spin-spin coupling, shift reagents, an elementary treatment of NOE phenomenon – 2D techniques (COSY, HSQC, HMBC, NOESY and ROSY).

UNIT –IV

ESR Spectroscopy: Instrumentation, Experimental technique, Intensity of ESR lines, g value and factors affecting ESR lines, Hyperfine interaction, Isotropic hyperfine interaction, Zero field splitting and Kramer's degeneracy, spin density and McConnell relationship, Application of ESR, Study of free radicals and inorganic compounds, Biological applications of ESR.

UNIT –V

Mass Spectrometry: Instrumentation – basic principles, EI and CI methods - base peak, isotopic peaks, metastable peak; parent peak, determination and use of molecular formula, recognition of molecular ion peak – FAB. Nitrogen rule, fragmentation, pattern of fragmentation for various classes of compounds, McLafferty rearrangement, Importance of metastable peaks.

Reference and Text Books:

1. Introduction to Spectroscopy (5th Edition, 2015) by Donald L. Pavia, Gary M. Lampman, George S. Kriz and James A. Vyvyan, Publisher: Cengage Learning
2. Organic Spectroscopy (3rd Edition, 2011) by William Kemp, Publisher: Macmillan.
3. Spectrometric Identification of Organic Compounds (6th Edition, 2010) by Francis X. Webster Robert M. Silverstein, Publisher: Wiley India Pvt Ltd
4. Specifications of Spectroscopy of Organic Compounds (6th Edition, 2004) by P.S. Kalsi, Publisher: New Age International Publishers
5. Principles and Applications of ESR Spectroscopy by Anders Lund, Shigetaka Shimada, Masaru Shiotani, Publisher: Springer Science & Business Media, 2011.

PAPER – III PHARMACEUTICAL CHEMISTRY
SUBCODE :203CHC13

UNIT I

ALKALOIDS — general methods of extraction from a plant source, colour reaction and detection — morphine and quinine with special reference to structure relationship (SAR) and uses. Chemistry of sulphonamides — sulphapyridine phthalyl sulphathiazole — sulpha furazole and protosil — preparation and uses — vitamins — classification of vitamins — vitamin A, B₁ and B₂, ascorbic acid — their synthesis, estimation and uses.

UNIT II

ENZYMES — characteristics — classification — composition and biological functions — composition of blood and blood plasma — analysis of serum proteins — functions of plasma proteins — osmotic regulation — functions of hemoglobin, transport of oxygen and maintenance of pH of blood — analysis of hemoglobin in blood — Rh factor — blood pressure — normal, high and low and to control — diagnostic test for sugar, salt and cholesterol in serum — medically important compounds of Al, P, As and Fe — their preparation and applications.

UNIT III

SYNTHESIS OF HETEROCYCLICS - drugs derived from — pyridine derivatives — triphenyl amine and mepyramine — quinoline derivatives — chloroquine and primaquine — pyrimidines — urides and barbiturates. Antibiotics — pharmacological action — structural elucidation — synthesis and rises of chloramphenicol and penidillin.

UNIT IV

ORGANIC DIAGNOSTIC AGENTS — x-ray contrast media (radiopaques) sodium diatrizolate, — evan's blue — indigocarmine — methylene blue — histamine — pentagastrin — xylose and sodium benzoate — clinical estimation of proteins, glucose, urea, blood, cholesterol and hemoglobin — analgesic — classification — narcotic analgesics — morphine and derivatives — totally synthetic analgesic — pethidine and methadones — antipyretic analgesics — salicylic acid derivatives, indolyl derivatives and p-aminophenol derivatives — synthetic — action and uses.

UNIT V

ANAESTHETICS— preparation and uses of general and local gaseous anaesthetics —ether, vinyl ether, methoxy fluorane, halogenated hydrocarbons like chloroform, halothane, trichloroethylene, ethyl chloride, cyclopropane, nitrous oxide. Thiopentane sodium, methohexitone and propanoid- local anaesthetics- cocaine and its derivatives. Antiseptic and disinfectants- phenols and related compounds, organic mercurials- dyes, cationic surface active agents, chloramine-T, chlorhexidine, diquaternium chloride. Preservatives, antioxidants, coloring, flavoring and sweetening agents, emulsifying agents-and suspending agents- ointment bases- disintegrating agents.

References:

- (1) H.Singh and Kapoor K.V. Vallabh Prakashan, Organic Pharmaceutical Chemistry, New Delhi.
- (2) Bentley and Drivers, Pharmaceutical Chemistry.
- (3) Allion Chidambaram, Pharmaceutical Chemistry.
- (4) Chatwal, Organic Pharmaceutical Chemistry.
- (5) S. Jayshree Ghosh, Pharmaceutical Chemistry, Chand & Co.
- (6) Chatwal, Inorganic Pharmaceutical Chemistry.