



ANDHRA UNIVERSITY

TRANS-DISCIPLINARY RESEARCH HUB

RESEARCH METHODOLOGY IN PHARMACY

Unit I: Introduction

Meaning and objectives of research, motivation and dedication in research, criteria of good research, ethics in research, plagiarism, scientific integrity, selecting a topic, importance of planning, planning experimentation, field work and accessing advanced facilities. Ethics concerning studies on animals and human volunteers, ICMR and CDSCO guidelines on ethics in research.

Unit II: Types of Research

Descriptive studies: Case report; Analytical studies: Ecology study, cross-sectional study, case-control study, cohort study; Experimental studies: Interventional trial studies: Randomized Control Studies, Uncontrolled trial studies; Qualitative study design: Case study, observations, in-depth interview; Pharmacokinetic studies and pharmacodynamic studies, Bioequivalence studies.

Unit III: Literature review

Journals: Standard journals in Pharmaceutical Sciences, Impact factor, Citations, web based journals, writing a research paper, popular websites for scientific literature, choosing a journal for sending research publications, styles of writing references. Search Engines like Google Scholar and Science Direct.

Patents: Importance of patenting, Steps in patenting process, accessing patent literature.

Unit IV: Modern Analytical techniques

Instrumentation and applications of the following techniques for research in pharmaceutical sciences

Chromatography: HPLC, GC, LCMS

Spectrophotometry: UV, IR, NMR, MASS, Fluorescence

X-ray Diffraction, DSC and thermo gravimetry

SEM and TEM

Unit V: Designing Research

Sampling and Randomization, Size of sample, Bias, Single Blind Design, Double blind design, Open Design, Completely Randomised Design, Randomised Block Design and Latin Square Design.

Unit VI: Optimisation

Optimization through Full Factorial design, Fractional Factorial Design, Simple Lattice, Response surface methodology - Box Benhen Design, Central Composite Design, Evolutionary operations procedure.

Unit VII: Testing of hypothesis

Theory, calculation and applications of t-test, z-test, Chi square test, one way ANOVA, two way ANOVA and three way ANOVA, Duncan's test and Tukey's test.

Unit VIII: Preparation of Thesis

Structure of thesis, background of the work, importance of language, grammar, scientific and systematic way of presentation, statistical analysis, use of graphical representation, proper preparation of graphs and tables, discussion, comparison with previous work, interpretation of in vitro and in vivo results, summary and conclusion.



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MODEL QUESTION PAPER

Time: 3 hours

Max. Marks: 100

Answer any FIVE Questions. All questions carry equal marks.

1. Discuss on the importance of ethics and planning in research in pharmaceutical sciences.
2. Explain how cohort studies, case studies and randomized control studies are carried out.
3. Write notes on any four important journals in the field of pharmaceutical sciences and
Discuss the criteria based on which you could choose a journal for sending your work.
4. Explain the principles and applications of High Performance Liquid Chromatography, Scanning Electron Microscopy, and X Ray Diffraction in pharmaceutical research.
5. Explain the theory, applications and analysis of Completely Randomised Design and Latin Square Design.
6. Explain full factorial design and Box Benhen design.
7. Explain about Chi square test and t test.
8. Explain how presentation of results and discussion of results is to be carried out.