

M.D./M.S.-AYURVEDA PRELIMINARY
PAPER-I
RESEARCH METHODOLOGY AND MEDICAL STATISTICS
PART-A
RESEARCH METHODOLOGY

1. Introduction to Research

- A. Definition of the term research
- B. Definition of the term anusandhan
- C. Need of research in the field of Ayurveda

2. General guidelines and steps in the research process

- A. Selection of the research problem
- B. Literature review: different methods (including computer database) with their advantages and limitations
- C. Defining research problem and formulation of hypothesis
- D. Defining general and specific objectives
- E. Research design: observational and interventional, descriptive and analytical, preclinical and clinical, qualitative and quantitative
- F. Sample design
- G. Collection of the data
- H. Analysis of data.
- I. Generalization and interpretation, evaluation and assessment of hypothesis.
- J. Ethical aspects related to human and animal experimentation.
- K. Information about Institutional Ethics Committee (IEC) and Animal Ethics Committee (AEC) and their functions. Procedure to obtain clearance from respective committees, including filling up of the consent forms and information sheets and publication ethics.

3. Preparation of research proposals in different disciplines for submission to funding agencies taking EMR-AYUSH scheme as a model.

4. Scientific writing and publication skills.

- A. Familiarization with publication guidelines- Journal specific and CONSORT guidelines.
- B. Different types of referencing and bibliography.
- C. Thesis/Dissertation: contents and structure
- D. Research articles structuring: Introduction, Methods, Results and Discussions (IMRAD)

5. Classical Methods of Research.

Concept of Pratyakshadi Pramana Pariksha, their types and application for Research in Ayurveda.

Dravya-, Guna-, Karma-Parikshana Paddhati

Aushadhi-yog Parikshana Paddhati

Swastha, Atura Pariksha Paddhati

Dashvidha Parikshya Bhava

6. Comparison between methods of research in Ayurveda (Pratigya, Hetu, Udaharana, Upanaya, Nigaman) and contemporary methods in health science

7. Different fields of Research in Ayurveda

Fundamental research on concepts of Ayurveda

- A. Panchamahabhuta and tridosha.
- B. Concepts of rasa, guna, virya, vipak, prabhav and karma
- C. Concept of prakriti-saradi bhava, ojas, srotas, agni, aam and koshta.

8. Literary

Research-

Introduction to manuscriptology: Definition and scope. Collection, conservation, cataloguing. Data mining techniques, searching methods for new literature; search of new concepts in the available literature. Methods for searching internal and external evidences about authors, concepts and development of particular body of knowledge.

9. Drug Research (Laboratory-based)- Basic knowledge of the following:

Drug sources: plant, animal and mineral. Methods of drug identification.

Quality control and standardization aspects: Basic knowledge of Pharmacopoeial standards and parameters as set by Ayurvedic Pharmacopoeia of India.

Information on WHO guidelines for standardization of herbal preparations. Good Manufacturing Practices (GMP) and Good Laboratory Practices (GLP).

10. Safety aspects: Protocols for assessing acute, sub-acute and chronic toxicity studies. Familiarization with AYUSH guidelines (Rule 170), CDCSO and OECD guidelines

11. Introduction to latest Trends in Drug Discovery and Drug Development

-Brief information on the traditional drug discovery process

-Brief information on the latest trends in the Drug Discovery process through employment of rational approach techniques; anti-sense approach, use of micro and macro-arrays, cell culture based assays, use of concepts of systems biology and network physiology

-Brief introduction to the process of Drug development

12. Clinical research:

Introduction to Clinical Research Methodology identifying the priority areas of Ayurveda

Basic knowledge of the following:-

Observational and Interventional studies

Descriptive & Analytical studies

Longitudinal & Cross sectional studies

Prospective & Retrospectives studies

Cohort studies

Randomized Controlled Trials (RCT) & their types

Single-case design, case control studies, ethnographic studies, black box design, cross-over design, factorial design.

Errors and bias in research.

New concepts in clinical trial- Adaptive clinical trials/ Good clinical practices (GCP)

Phases of Clinical studies: 0,1,2,3, and 4.

Survey studies -

Methodology, types, utility and analysis of Qualitative Research methods. Concepts of in-depth interview and Focus Group Discussion.

13. Pharmacovigilance for ASU drugs. Need, scope and aims & objectives.

National Pharmacovigilance Programme for ASU drugs.

14. Introduction to bioinformatics, scope of bioinformatics, role of computers in biology.

Introduction to Data base- Pub med, Medlar and Scopus. Accession of databases.

15. Intellectual Property Rights- Different aspect and steps in patenting. Information on Traditional Knowledge Digital Library (TKDL).

MEDICAL STATISTICS

Teaching hours: 80

1. **Definition of Statistics** : Concepts, relevance and general applications of Biostatistics in Ayurveda
2. **Collection, classification, presentation, analysis and interpretation of data** (Definition, utility and methods)
3. **Scales of Measurements** - nominal, ordinal, interval and ratio scales.
Types of variables - Continuous, discrete, dependent and independent variables.
Type of series - Simple, Continuous and Discrete
4. **Measures of Central tendency** - Mean, Median and Mode.
5. **Variability**: Types and measures of variability - Range, Quartile deviation, Percentile, Mean deviation and Standard deviation
6. **Probability**: Definitions, types and laws of probability,
7. **Normal distribution**: Concept and Properties, Sampling distribution, Standard Error, Confidence Interval and its application in interpretation of results and normal probability curve.
8. **Fundamentals of testing of hypotheses**:
Null and alternate hypotheses, type I and type 2 errors.
Tests of significance: Parametric and Non-Parametric tests, level of significance and power of the test, 'P' value and its interpretation, statistical significance and clinical significance
9. **Univariate analysis of categorical data**:
Confidence interval of incidence and prevalence, Odds ratio, relative risk and Risk difference, and their confidence intervals
10. **Parametric tests**: 'Z' test, Student's 't' test: paired and unpaired, 'F' test, Analysis of variance (ANOVA) test, repeated measures analysis of variance
11. **Non parametric methods**: Chi-square test, Fisher's exact test, McNemar's test, Wilcoxon test, Mann-Whitney U test, Kruskal - Wallis with relevant post hoc tests (Dunn)
12. **Correlation and regression analysis**:
Concept, properties, computation and applications of correlation, Simple linear correlation, Karl Pearson's correlation co-efficient, Spearman's rank correlation.
Regression- simple and multiple.
13. **Sampling and Sample size computation for Ayurvedic research**:
Population and sample. Advantages of sampling, Random (Probability) and non random (Non-probability) sampling. Merits of random sampling. Random sampling methods- simple random, stratified, systematic, cluster and multiphase sampling. Concept, logic and requirement of sample size computation, computation of sample size for comparing two means, two proportions, estimating mean and proportions.
14. **Vital statistics and Demography**: computation and applications - Rate, Ratio, Proportion, Mortality and fertility rates, Attack rate and hospital-related statistics
15. **Familiarization with the use of Statistical software** like SPSS/Graph Pad

PRACTICAL

100 marks

I. RESEARCH METHODOLOGY

Teaching hours 120

PRACTICAL NAME

1. Pharmaceutical Chemistry

Familiarization and demonstration of common lab instruments for carrying out analysis as per API

2. Awareness of Chromatographic Techniques

Demonstration or Video clips of following:

Thin-layer chromatography (TLC).

Column chromatography (CC).

Flash chromatography (FC)

High-performance thin-layer chromatography (HPTLC)

High Performance (Pressure) Liquid Chromatography (HPLC)

3. Gas Chromatography (GC, GLC)

4. Pharmacognosy

Familiarization and Demonstration of different techniques related to:-

Drug administration techniques- oral and parenteral.

Blood collection by orbital plexuses puncturing.

Techniques of anesthesia and euthanasia.

Information about different types of laboratory animals used in experimental research

Drug identification as per API including organoleptic evaluation

5. Pharmacology and toxicology

Familiarization and demonstration of techniques related to pharmacology and toxicology

6. Biochemistry (Clinical)

Familiarization and demonstration of techniques related to basic instruments used in a clinical biochemistry laboratory – semi and fully automated clinical analyzers, electrolyte analyzer, ELISA- techniques, nephelometry.

Demonstration of blood sugar estimation, lipid profiles, kidney function test, liver function test.

HbA1, cystatin and microalbumin estimation by nephelometry or other suitable techniques.

Interpretation of the results obtained in the light of the data on normal values.

7. Clinical Pathology

Familiarization and demonstration of techniques related to basic and advanced instruments used in a basic clinical pathology lab. Auto cell counter, urine analyzer, ESR, microscopic examination of urine.

8. Imaging Sciences

Familiarization and demonstration of techniques related to the imaging techniques.

Video film demonstration of CT-Scan, MRI-scan and PET-scan.

9. Clinical protocol development

II. MEDICAL STATISTICS

Practical hours:20

Statistical exercise of examples from Topic number 4, 5, 8-12, 14, 15.

Records to be prepared.

Distribution of marks (practical):

I.	Instrumental spotting test	- 20 marks
II.	Clinical protocol writing exercise on a given problem	- 20 marks
III.	Records:	
IV.	Research methodology	-10 Mark
V.	Medical statistics	-10 marks
VI.	Viva- Voce	-40 Marks

REFERENCE

BOOKS:-

Pharmacognosy:

1. Aushotosh Kar "Pharmacognosy & Pharmacobiotechnology" New Age International Publisher. Latest Edition. New Delhi.
2. Drug Survey by Mayaram Uniyal
3. Fahn A (1981). Plant Anatomy 3rd Edition Pergamon Press, Oxford
4. Kokate, CK., Purohit, AP, Gokhale, SB (2010). Pharmacognosy. Nirali Prakashan. Pune.
5. Kokate, CK., Khandelwal and Gokhale, SB (1996). Practical Pharmacognosy. Nirali Prakashan. Pune.
6. Trease G E and Evans W C, Pharmacognosy, Bailliere Tindall, Eastbourne, U K.
7. Tyler V C., Brady, L R., and Robers J E., Pharmacognosy, Lea and Febiger, Philadelphia.
8. Tyler VE Jr and Schwarting AE., Experimental Pharmacognosy, Burgess Pub. Co, Minneapolis, Minnesota.
9. Wallis- TE (2011)- reprint. Practical Pharmacognosy (Fourth Edition) Pharma Med Press, Hyderabad.
10. Wallis T E, Analytical Microscopy, J & A Churchill limited, London.
11. Wallis T E., Text Book of Pharmacognosy, J & A Churchill Limited, London.
12. WHO guidelines on good agricultural and collection practices- (GACP) for medicinal plants (2003).World Health Organization- Geneva.
13. WHO monographs on selected medicinal plants (1999)—Vol. 1. 1.Plants, Medicinal 2.Herbs 3.Traditional medicine. ISBN 92 4 154517 8. WHO Geneva.

Pharmaceutical chemistry, quality control and drug standardization:

1. Ayurvedic Pharmacopoeia of India. Part I- volume 1 to 8 and Part II- volume 1to 3. Ministry of Health and Family Welfare. Controller of Publication. Govt of India. New Delhi.
2. Brain, KR and Turner, TD. (1975). The Practical Evaluation Phytopharmaceuticals. Wright Scientechnica, Bristol.
3. Galen Wood Ewing (1985). Instrumental Methods of Chemical Analysis. McGraw-Hill College ; Fifth edition
4. Harborne, JB (1973). Phytochemistry Methods. Chapman and Hall, International Edition, London.

5. HPTLC- Fingerprint atlas of Ayurvedic Single Plant Drugs mentioned in Ayurvedic Pharmacopoeia Vol- III and IV. CENTRAL COUNCIL FOR RESEARCH IN AYURVEDA AND SIDDHA. New Delhi.
6. Kapoor, RC (2010). Some observations on the metal based preparations in Indian System of Medicine. Indian Journal of Traditional Knowledge. 9(3): 562-575
7. Khopkar, S. M. Analytical Chemistry, New Age International Publishers , 3 rd edition
8. Laboratory Guide for- The Analysis of Ayurved and Siddha Formulations – CCRAS, New Delhi.
9. Mahadik KR, Bothara K G. Principles of Chromatography by, 1st edition, Nirali Prakashan.
10. Qadry JS and Qadry S Z., Text book of Inorganic Pharmaceutical and Medicinal Chemistry, B. S. Shah Prakashan, Ahmedabad.
11. Quality Control Methods for Medicinal Plant Material. Reprint (2002). WHO- Geneva.
12. Rangari V.D., Pharmacognosy & Phytochemistry, Vol I, II, Career Publication,
13. Sharma BK. Instrumental Methods of Chemical Analysis by, Goel Publishing House.
14. Srivastav VK and Shrivastav KK. Introduction to Chromatography (Theory and Practice)
15. Stahl E., Thin Layer Chromatography - A Laboratory Handbook, Springer Verlag, Berlin.
16. Sukhdev Swami Handa, Suman Preet Singh Khanuja, Gennaro Longo and Dev Dutt Rakesh (2008).
Extraction Technologies for Medicinal and Aromatic Plants -INTERNATIONAL CENTRE FOR SCIENCE AND HIGH TECHNOLOGY- Trieste,

Biochemistry and Laboratory techniques:

1. Asokan P. (2003) Analytical Biochemistry, China publications,
2. Campbell, P.N and A.D .Smith, Biochemistry Illustrated, 4th ed, Churchill Livingstone.
3. David Frifelder. W. H. Freeman. (1982). Physical Biochemistry by; 2 edition
4. David Sultan (2003).Text book of Radiology and Imaging, Vol-1, 7th Edition.
5. Deb, A.C., Fundamentals of Biochemistry, Books and Allied (P) Ltd, 2002.
6. Harold Varley. Practical Clinical Bio-chemistry
7. Kanai L.Mukherjee. Clinical Pathology;,Medical Laboratory Technology Vol. I.Tata McGrawHill 1996, New Delhi.
8. Gradwohl, Clinical Laboratory-methods and diagnosis, Vol-I
9. Clinical Biochemistry -Sabitri Sanyal, Clinical Pathology, B.I.Churchill Livingstone (P) Ltd, New Delhi.2000.
10. Satyanarayanan,U. Essentials of Biochemistry, Books and allied(P) Ltd.2002
11. Zubay, G.L. Biochemistry, W.M.C. Brown Publishers, New York 1998.
12. Text book of Radiology and Imaging, Vol-1, David Sultan, 7th Edition. 2003.

Research methodology:

1. Alley, Michael. The craft of scientific writing. Englewood Cliffs. N.N. Prentice 1987.
2. Ayurvediya Anusandhan Paddhati – P.V. Sharma
3. Altick and Fenstermaker. (2007).*The Art of Literary Research*. 4th ed. W. W. Norton. Castle, Gregory. *Blackwell Guide to Literary Theory*. Blackwells,
4. Bowling, A. (2002). Research Methods in Health (2nd ed). Buckingham: Open University Press.
5. Day R.A. How to write a scientific paper. Cambridge University Press.
6. Cooray P.G. Guide to scientific and technical writing.

7. Deepika Chawla and Neena Sondhi. (2011). *Research Methods- Concepts and cases*. New Delhi: Vikas Publishing House.
8. Greenhalgh, T. (2006) *How to Read a Paper: The Basics of Evidence-Based Medicine*. (3rd ed) Blackwell
9. Kothari- CR (2004). *Research Methodology- Methods and Techniques* (Second Revised Edition). New Age International Publishers- New Delhi.
10. Kumar, R. 2005. *Research Methodology: a Step-by-Step Guide for Beginners, 2nd ed*. Thousand Oaks, CA, London: Sage Publications.
11. Petter Laake, Haakon Breien Benestad and Bjørn Reino Olsen. (2007). *Research Methodology in the Medical and Biological sciences*. Academic Press is an imprint of Elsevier, 84 Theobald's Road, London WC1X 8RR, UK. ISBN: 978-0-12-373874-5
12. Relevant portions of Ayurvedic Samhitas and other texts

Drug research and development:

1. RICK NG, (2009). *DRUGS- from discovery to approval*. John Wiley & Sons, Inc., Hoboken, New Jersey
2. *Research guidelines for evaluating the safety and efficacy of herbal medicines*. (1993). . WHO- (Regional Office for the Western Pacific – Manila) ISBN 92 9061 110 3 (NLM Classification: WB 925).
3. Jagdeesh, Sreekant Murthy, Gupta, YK and Amitabh Prakash Eds. *Biomedical Research (From Ideation to Publication)* (2010). Wolters Kluwer/ Lippincott Williams and Wilkins.
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7. OECD (2000) *Guidance Document on Acute Oral Toxicity*. Environmental Health and Safety Monograph Series on Testing and Assessment No 24.
8. OECD Guideline for the Testing of Chemicals – Repeated Dose 90-day Oral Toxicity Study in Rodents, 408, 1998. <http://browse.oecdbookshop.org/oecd/pdfs/free/9740801e.pdf> (latest version)
9. OECD Series on Principles of Good Laboratory Practice (GLP) and Compliance Monitoring, 1998. http://www.oecd.org/document/63/0,2340,en_2649_34381_2346175_1_1_1_1,00.php
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13. Kulkarni S.K.: *Hand Book of Experimental Pharmacology*, Vallabh Prakashan, New Delhi
14. Ravindran R.: X-Pharm (Software), Indian Journal of Pharmacology, JIPMER, Pondicherry.

Biotechnology and Bio-informatics:

1. Angela M. Meireles A (2009). Extracting Bioactive compounds for food products. Theory and applications. CRC- Press Taylor and Francis Group.
2. Bergeron BP 2002 Bioinformatics Computing 1st Edition, Prentice Hall
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5. Satyanarayana, U.: Biotechnology, Books and Allied (P) Ltd, Kolkata, 2005
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7. <http://www.iitb.ac.in/~crnts>.
8. <http://www.zygogen.com>.
9. <http://www.dsr.nic.in/reports/tifp/database/metallo.pdf>.
10. www.consort-statement.org
11. www.strobe-statement.org
12. www.icmr.nic.in

Clinical Evaluation:

1. CDSCO, Good Clinical Practices For Clinical Research in India, Schedule Y (Amended Version – 2005), <http://cdsco.nic.in/html/GCP1.php>
2. Ethical Guidelines for Biomedical Research on Human subjects. (2000). Indian Council of Medical Research- New Delhi.
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6. ICH Harmonised Tripartite Guidelines for Good Clinical Practices.(1997)- Quintles- Published by Brookwood Medical Publications. Richmond, Surrey. United Kingdom.
7. NCI. *Clinical Trials Education Series*. <http://www.cancer.gov/clinicaltrials/learning/clinical-trials-education-series>, 2001.
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9. William C. Scheffer Introduction to Clinical Researchs

Medical Statistics:

1. Armitage, P. and Berry, G. (1994) Statistical Methods in Medical Research (3rd ed). Blackwell Science.

2. Armitage P, Berry G, Matthews JNS: *Statistical Methods in Medical Research*. Fourth edition. Oxford, Blackwell Science Ltd; 2002
3. Bland, M. (2000) *An Introduction to Medical Statistics* (3rd ed). Oxford: Oxford University Press.
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13. Symalan, K. (2006). *Statistics in Medicine* (First Edition) Trivandrum: Global Education Bureau.
14. Sundar Rao, Jesudian Richard - *An Introduction to Biostatistics*.
15. Suhas Kumar Shetty- *Medical statistics made easy*

M.D.-AYURVEDA PRELIMINARY

1. AYURVED SAMHITA & SIDDHANTA (Ayurvedic Compendia & Basic Principles)

PAPER-II

THEORY- 100 marks

PART-A

Practical- Viva-Voce-100

50 marks

1. Learning and Teaching methodology available in Samhita- Tantrayukti, Tantraguna, Tantradasha, Tachchilya, Vadamarga, Kalpana, Arthashraya, Trividha Gyanopaya, teaching of Pada, Paada, Shloka, Vakya, Vakyartha, meaning and scope of different Sthana and Chatushka of Brihatrayee.
2. Manuscriptology - Collection, conservation, cataloguing, Critical editing through collation, reception (A critical revision of a text incorporating the most plausible elements found in varying sources), emendation (changes for improvement) and textual criticism (critical analysis) of manuscripts. Publication of edited manuscripts.
3. Concept of Bija chatustaya (Purush, Vyadhi, Kriyakaal, Aushadha according to Sushrut Samhita).
4. Introduction and Application of Nyaya (Maxims) - Like Shilaputrak Nyaya, Kapinjaladhikaran Nyaya, Ghunakshara Nyaya, Gobalivarda Nyaya, Naprishtah Guravo Vadanti Nyaya, Shringagrahika Nyaya, Chhatrino Gacchhanti Nyaya, Shatapatrabhedana Nyaya, Suchikatah Nyaya.
5. Importance and utility of Samhita in present era.
6. Importance of ethics and principles of ideal living as mentioned in Samhita in the present era in relation to life style disorders.
7. Interpretation and co-relation of basic principles with contemporary sciences.

PART-B

50 marks

1. Definition of Siddhanta, types and applied examples in Ayurveda.
2. Ayu and its components as described in Samhita.
3. Principles of Karana-Karyavada, its utility in advancement of research in Ayurveda.
4. Theory of Evolution of Universe (Srishti Utpatti), its process according to Ayurveda and Darshana.
5. Importance and utility of Triskandha (Hetu, Linga, Aushadh) and their need in teaching, research and clinical practice.
6. Applied aspects of various fundamental principles: Tridosha, Triguna, Purusha and Atmanirupana, Shatpadartha, Ahara-Vihara. Scope and importance of Pariksha (Pramana).
7. Importance of knowledge of Sharir Prakriti and Manas Prakriti.
8. Comparative study of Principles of Ayurveda and Shad Darshanas.

REFERENCE BOOKS:-

1. Charak Samhita
2. Sushrut Samhita
3. Ashtanga Samgraha
4. Ashtanga Hridaya
5. Vaisheshika Darshan
6. Nyaya Darshan
7. Yoga Darshan
8. Vedantsara
9. Sarvadarshan Samgraha
10. Bhartiya Darshan
11. Ayurved Darshanam

Chakrapani commentary
Dalhana Commentary
Indu commentary
Arundutta and Hemadri commentary
Prashastapada Bhasya
Vatsyayan Bhasya Patanjala
Vyas Bhasya

Baldev Upadhyaya
Acharya Rajkumar Jain

M.D.-AYURVEDA PRELIMINARY

RACHANA SHARIR (Anatomy)

PAPER-II

Theory 100 marks

PART-A

50 marks

1. Basic principles of Sharira, Purushavichaya, Rashi Purusha, Karma Purusha (Shad Dhatuj Purusha), Chaturvimshati Purusha, Ek Dhatu Purusha. Relevant principles described in the Sharirasthan of Sushrut Samhita, Charak Samhita, Ashtang Sangrah and Ashtang Hridaya.
2. Basic principles of Garbha Sharira in Ayurveda: Definitions of Garbha, Shukra Shonita Siddhanta, Dauhrida, Matrijadi Garbhotpattikar bhava.
3. Types of tissues, histological study of liver, spleen, uterus, kidney, endocrine glands, mammary gland, skin, tongue, lungs, bronchi, bones, muscles, cartilages and nervous tissue.

PART-B

50 marks

1. Paribhasha Sharira (Anatomical terminology)
2. Pramana Sharira – Anguli and Anjali Pramana, Sama pramana Sharira, Ayama – Vistara and their prognostic values.
3. Fundamental aspects of Asthi, Sandhi, Peshi Sharir.
4. Fundamental aspects of Sira, Dhamani, Srotas – Definitions, Siravedha, Avedhya Sira.
5. Fundamental aspect of Srotomoola Sthana.
6. Fundamental aspects of Kosktha and Koskthang: Hridaya, Yakrit, Vrikka, phupphusa, Aantra, Pleeha, Adhivrikkagranthi, Basti, Paurushagranthi, Amashaya, Agnyashaya and Vrishana.
7. Fundamental aspects of Uttamangiya Sharir – Introduction to Nervous system - development, divisions, neuron–structure, types, functional anatomy.
8. Mrita shodhan (as per Sushruta) and Mrita Samrakshana (preservation method of human cadaver).

PRACTICAL

100 marks

Contents:

1. Practical study of bones
2. Practical study of organs
3. Practical study of surface and radiological anatomy.
4. Shava Vichhedana – detailed dissection of the whole body.
5. Practical study of location of Marma
6. Demonstration of histology slides (10 slides)

Distribution of marks (Practical)

- | | |
|---|------------|
| 1. Spotting | - 20 Marks |
| 2. Surface Anatomy | - 20 Marks |
| 3. Dissection | - 30 Marks |
| 4. Imaging Anatomy – Basic Principles and Application | - 10 Marks |
| 5. Viva-Voce | - 20 Marks |

REFERENCE BOOKS:

- | | |
|---|-----------------------------|
| 1. Relevant matters of Brihatrayee and Laghutrayee | |
| 2. PratyakshaShariram | - GananathSen |
| 3. AbhinavaShariram | - Damodar Sharma Gaur |
| 4. Parishadyam Sabdartha Shariram | - Damodara Sharma Gaur |
| 5. Brihat Shariram | - P S Varier |
| 6. Shiva Samhita | |
| 7. Gray's Anatomy | - Latest Edition |
| 8. Human Anatomy | - B D ChaurasiaCunningham's |
| 9. Companion to Manual of Practical Anatomy.Vol I, II & III | |
| 10. Developing Human | - Keith L Moore &Persaud |
| 11. Clinically oriented Anatomy | - Keith L Moore |
| 12. Clinically oriented Neuro Anatomy | - Richard Snell |
| 13. Surface and Radiological Anatomy | - Halim |
| 14. Grant's Methods of Anatomy | -Grant |
| 15. Grant's dissector | -Grant |
| 16. Human Embryology | -I. B. Singh |
| 17. Ayuurvediya Human Anatomy | - G. M. Kanthi |

M.D.-AYURVEDA PRELIMINARY

DRAVYAGUNA VIGYAN

(Materia Medica & Pharmacology)

PAPER-II

PART-A

Theory 100 Marks

50 marks

1. Panchamahabhuta siddhanta, Samanya Vishesha siddhanta, Tridosha siddhanta.
2. Extensive study on classifications of Dravya as described in Brihatrayi.
3. Applied aspects of Rasa, Guna, Virya, Vipaka and Prabhava
4. Applied aspects of Aushdha karma with reference to Sharngadhara and Bhavaprakasha
Importance of Namarupa vigyan and concept of basonyms and synonyms of Dravyas
5. Applied knowledge of Bhaishajya Prayoga (marga, kalpana, matra, anupana, sevan, kala etc.)

PART-B

50 marks

1. Basic principles of Desha pravichara, Dravya sangrahana (collection), Samrakshana (preservation)
2. Evolution of Dravyaguna vigyan with special emphasis on Nighantus
3. Prashasta bhesaj lakshana
4. Profound knowledge on applied aspects of Agrya aushadha
5. Methodology of studying controversial, pratinidhi (substitute), apamishrana (adulterant) and unidentified dravya
6. Pharmacognosy and its relevance in Dravyaguna vigyan
7. An integrated study of Charakokta Bhesaj pariksha and scientific method of drug evaluation with special reference to quality, safety and efficacy
8. Brief knowledge and importance of clinical pharmacology
9. General principles of various good cultivation practices, collection practices, storage practices and manufacturing practices
10. Pharmacovigilance and ADR issues
11. Knowledge on the Ayurvedic Pharmacopoeia of India, The Formulary of India and international pharmacopoeias

PRACTICAL

100 marks

Contents:

1. Field visits for the Identification of important classical medicinal plants (Minimum two visits to neighboring forest areas)
2. Macroscopic and microscopic identification of minimum two plants of each of prayojyanga (useful parts of plants)
3. Preliminary study of pharmacoepial standards (API) of minimum 5 plants
4. Minimum two experiments on Animals

Distribution of marks (Practical)

1. Herbarium sheets	-10 Marks
2. Practical of macroscopic and microscopic identification of prayojyanga (one part of the plant)	-30 Marks
Practical record book of pharamcopoeial standards and animal experimentations	-10 Marks
Spotting	-30 Marks
Viva-voce	-20 Marks

REFERENCE BOOKS:

1. Abhinav Buti Darpan (Vol.1-2)	-	Vd. Roop Lal Vaishya
2. Aushadna Vigyna Shastra	-	Acharya Pt. Vishvanatha Dwidevi
3. Ayurvediya Aushadnkarma vigyana	-	Acharya V.J. Thakur
4. Bedi Vanaspati Kosha	-	Prof. Ramesh Bedi
5. Bhaishajyaguna Vigyana	-	Dr. Alakhnarayan Singh
6. Bhav Prakash Nigantu (English)	-	Shreekanthamurti
7. Bhav Prakash Nighantu	-	With Vd. Krishna Chandra Chunekar Commentary
8. Bhrinad dravyagunadarsha	-	Mahendra Kumar Shastri
9. Classical Uses of Medicinal Plants	-	Acharya Priyavrata Sharma
10. Controversial Medicinal Plants	-	Vd. G. Bapa Lal
11. Dalhana Ka Dravyaguna Shastra Ke Kshetra Me Yogadana	-	Vd. Shiv Kumar Vyas
12. Dravyaguna Kosha	-	Acharya Priyavrata Sharma
13. Dravyaguna Sutram	-	Acharya Priyavrata Sharma
14. Dravyaguna Vigyana	-	Dr. Gyanendra Pandey
15. Dravyaguna Vigyana(Vol. 1-2)	-	Acharya Yadavji Tikram Ji
16. Dravyaguna Vijyana	-	Dr. V.M. Gogate
17. Dravyaguna Vigyana (Vol. 1-5)	-	Acharya Priyavrata Sharma
18. Dravyaguna Shastrum	-	Vaidya G.A. Phadake
19. Dravyaguna Vijyana	-	Dr. A.P. Deshpande
20. Dravyagunavijnana basic Principles	-	Prof.D.S.Lucas
21. Forgotten Healers (Indian Medicinal Plants)-	-	Dr. Prakash Pranjape
22. Glossry of Vegetable Drugs in Bhrittrayis -Thakur	-	Balwant Singh & Vd. Krishna Chandra Chunekar
23. Introduction to Dravyaguna	-	Acharya Priyavrata Sharma
24. Kriyatamka Aushadi Parichaya	-	Acharya Pt. Vishvanath Dwidevi
25. Materia Medica	-	Acharya Ghosh
26. Nighantu Adarsh (Vol. 1-2)	-	Vd. Bapa Lal
27. Pharmacological basis of Medical Practice-	-	Goodman & Gillman
28. Pharmacology and Pharmacotherapeutics-	-	Satoskar Bhandarkar & Ainapure
29. Prayogatamaka Dravyaguna Vigyana	-	Dr. Maya Ram Uniyal
30. Priya nighantu	-	Acharya Priyavrata Sharma
31. Raspanchaka/Dravyaguna Siddhanta	-	Prof. Shivcharan Dhyani
32. System of Plant Nomenclature in Ayurveda-	-	Dr. Gyanendra Panday
33. Text Book of Pharmaconogy	-	Trees & Valis
34. Textbook of Dravyaguna	-	Dr.K.Nishteswar
35. Unani Dravyaguna Vigyana	-	Hakim Daljeet Singh
36. Useful parts of Charaka, Sushurut, and Vagbhata.-	-	
37. Uttarakand Ki Vanaspatiya	-	Dr. Gyanendra Pandey
38. Vanoaushadi Darshika	-	Thakur Balwant Singh

39. Vanoaushadi Nidarshika - Dr. Ram Sushil Singh
40. Vedic Vanaspatiyam - Dr. Dinesh Chandra Sharma
41. Pharmacopia of India -all the volumes
42. Database on medicinal plants all the volums of CCRAS
43. Aurveda formulary of india - all the volums
44. All the nighantoos
45. Laghutrayi

M.D.-AYURVEDA PRELIMINARY

KAUMARBHRITYA - BALA ROGA

(Pediatrics)

PAPER-II

Theory- 100 marks

PART A

50 marks

1. Development of Kaumarbhritya tantra including ancient and modern literature. Strength of Ayurveda specific to child health care.
2. Vayobheda (Classification of age) according to different classics
3. Anatomical and physiological differences in child compared to adult.
4. Ayurvedic consideration of physiology and pathology of Dosha, Dhatu, Mala, Oja, Agni, Prakriti (sharirika-manasika), Kaya and Dhatuposhana in children.
5. Basic Concepts of growth and development, and its assessment.
6. Ayurvedic and modern clinical methods of examination of healthy and diseased newborn and children.
7. Knowledge of modern diagnostic tools like clinical and laboratory investigations, X-ray, USG, MRI etc.
8. Fundamentals of Ayurvedic treatment for childhood disorders.
9. Applied pharmacological considerations: Ayurvedic and modern concepts of drug doses, administration, distribution, metabolism, excretion, and other important factors of consideration.
10. National programs related to pediatrics.
11. Childhood Samskara
12. Principles of Child Psychology (Ayurvedic & modern concepts)

PART B

50 marks

1. Concept of Bala Rasayana and its application in physical and mental health of children.
2. Concept of Vyadhi-Kshamatva avam Vardhanopaya. Concept of immunity and immune enhancing measures including immunization.
3. Concept of Dhupana and Raksha karma and their clinical application in pediatric practice
4. Basic concepts of single drugs commonly used in pediatric practice with special reference to their karma like- Guduchi, Yastimadhu, Mandukaparni, Shankhapushpi, Ativisha, Pippali, Maricha, Shunti, Haritaki, Amalaki, Tulasi, Bhumyamalaki, Daruharidra, Haridra, Vidanga, Katuki, Dadima, Brahmi, Ashvagandha, Shatavari, Bala, Kampillaka, Trivrita, Jyotishmati, Vacha, Jeevanti, Rasna, Shatavari, Anantamula (Krishna Sariva), Durva, Khadir, Tankana, Tambula, Jatamansi, Sphatika.
5. Knowledge of their ingredients, indications, precautions and specific considerations including adverse drug reactions (ADR) of commonly used Ayurvedic formulations in pediatric practice e.g. Aravindasava, Baalachaturbhadra Churna, Kumarakalyana Rasa, Saraswatarista, Swarnaprashana (Kashyapa Samhita), Kumaryasava, Kushmanda Rasayana (Sharangdhar), Ashvagandha Rasayana (Ashtanga Hridaya), Brahmi Ghrita, Kalyanaka Ghrita, Talishadi Churna, Sitopaladi Churna, Haridra Khanda, Krimikuthara

Rasa, Mugdha Rasa, Dantodbheda-Gadantaka Rasa, Rajanyadi Churna (Ashtanga Hridaya), Samvardhana Ghrita, Ashta Mangal Ghrita.

6. Methods of preparation of various specific Kalpana (e.g. Lehya, Syrup, drops etc.) according to needs of children.
7. Common instruments and their application in new born care and general pediatric practice.
8. Specific considerations in research methods related to Pediatrics.
9. Regulatory laws related to child health management.

PRACTICAL

100 marks

Contents:

1. a) In-patient case history record -(25 Patient)
b) Child Health record - (50 Case)
2. Involvement in Outreach and National programs:
a) School Child health checkup
b) Adolescent education
c) Adolescent counseling etc
3. Pediatric ward/nursery management.

Distribution of marks (Practical)

1. a) Case History Record - (25 Patient) - 10 Marks
b) Child Health record - (50 Case) - 10 Marks
2. Bed side clinical case taking
a) Long Case - 20 Marks
b) Short Case - 10 Marks
3. Procedures/ Kriya Kalpa - 15 Marks
4. Identification of instruments & Spotting - 15 Marks
5. Viva-voce - 20 Marks

REFERENCE BOOKS:

1. Kashyapa Samhita Complete Hindi translation by Satyapal Vidhyalankara English translation by Prof. Premvati Tiwari
2. Principles & practice of Pediatrics in Ayurveda: CHS Shastry
3. Child Health Care in Ayurveda: Abhimanyu Kumar
4. Ayurvedic Concepts of human Embryology: Abhimanyu Kumar
5. Kaumarbhritya by Prof. D.N. Mishra
6. Kaumarbhritya Ke Antargata Balgraho Ka Kramika Evam Vaigyanika Adhyana by Prof. Chanchal Sharma
7. Notes on Kaumarbhritya-by Dr. Dinesh K S
8. Pran - Pratyagamanam-by Dr. B.M. Singh
9. Ayurveda Dwara Matra Evam Shishu Paricharya by Dr. KS Patel, V.K. Kori & Rajgopal S.
10. Kaumarbhritya related references from Charaka Samhita, Sushruta Samhita Vagbhata etc.
11. Clinical Methods in Paediatrics by Meharban Singh
12. Pediatrics Emergencies by Meharban Singh
13. Essential Pediatrics O.P. Ghai

14. Text Book of Pediatrics Nelson

15. Care of New Born by Meharban Singh

AYURVED SAMHITA & SIDDHANT (FINAL YEAR)

Theory- 400 marks(100 Each)

Practical and Viva-Voce - 100 marks

PAPER –I Charak Samhita

Charak Samhita complete with Ayurved Dipika commentary by Chakrapani.

Introductory information regarding all available commentaries on Charak Samhita

PAPER –II Sushrut Samhita & Ashtang-Hridayam

Sushrut Samhita Sutra sthana and Sharir- sthana. with Nibandha Samgraha commentary by Acharya Dalhana.

Ashtang-Hridayam Sutra Sthanamatram with Sarvanga Sundara commentary by Arun Dutt.

Introductory information regarding all available commentaries on Sushrut Samhita and Ashtang Hridaya.

PAPER – III Ayurvediya and Darshanika Siddhanta

Introduction and description of philosophical principles incorporated in Charak Samhita, Sushrut Samhita, Ashtanga Hridya, shtang Samgraha.

Analysis of principles specially loka-purusha samya, Shadpadartha, Praman, Srishti Utpatti, Panchmahabhuta, Pilupaka, Pitharpaka Karana- Karyavada, Tantrayukti, Nyayas (Maxims), Atmatatva siddhant.

Importance of Satkaryavad, Arambhavada, Parmanuvada Swabhavoparamvada, Swabhava Vada, Yadricha Vada, Karmvada.

Practical applicability principles of Samkhya- Yoga, Nyaya-Vaisheshika, Vedanta and Mimansa.

PAPER – IV Ayurved Itihas and Prayogika Siddhant.

Post independent Development of Ayurveda: Education, Research.

Globalisation of Ayurved.

Introduction of department of AYUSH, CCIM, CCRAS, RAV.

Tridosh Siddhant.

Panchabhautik Siddhant

Manastatva and its Chikitsa Siddhant.

Naishthiki Chikitsa.

Practical applicability principles of Charvak, Jain & Bauddha Darshana.

Journals, types of Journals review of Articles.

Practical- Viva-voce

- 100 Marks

(50 case sheets are to be filled from samhita siddhant IPD / OPD)

Reference Books

Charak Samhita with Chakrapani commentary.

Sushruta Samhita with Dalhana Commentary.

Ashtanga Samgraha with Sarvangsundara.

Ashtanga Hridaya with Sarvangasundara.

Vaisheshika Darshan – Prashastapada Bhasya

Nyaya Darshan - Vatsyayan Bhasya Patanjala

Yoga Darshan- Vyas Bhasya

Vedantsara

Sarvadarshan Samgraha

Bhartiya Darshan - Baldev Upadhyaya.

Ayurved Darshanam - Acharya Rajkumar Jain.

Ayurved Darshan Vimarsha- Dr O.P. Upadhyay.

Ayurvediy Jeevak Su -Dr O.P. Upadhyay.

Padartha Vidnyan - Dr O.P. Upadhyay.

Scientific Exploration of Ayurved – Dr. Sudhir Kumar.

2. AYURVEDA SAMHITA & SIDHANTA (Basic Principles)

Astanga Hridaya, Charaka (P,U), Padartha Vignana & Ayurveda Ithihasa, Sanskrit

1	Dr. B. P. Pandey	Group leader	
2	Dr. Mahesh Vyas	Coordinator -	Coordinator
3	Dr. B. L. Gaur	Samhitha & Siddantha U.G. & P.G.	-
4	Dr. O. P. Upadhyaya	Samhitha & Siddantha U.G. & P.G.	
5	Dr. H. P. Sharma	Samhitha & Siddantha U.G. & P.G.	
6	Dr. S. L. Sharma	Samhitha & Siddantha U.G. & P.G.	
7	Dr. R. D. Thakkur	Samhitha & Siddantha U.G. & P.G.	
8	Dr. Naresh Sharma	Samhitha & Siddantha U.G. & P.G.	
9	Dr. Yogita Jamadade	Samhitha & Siddantha U.G. & P.G.	
10	Dr. Abichal C.	Samhitha & Siddantha U.G. & P.G.	
11	Dr. Mohan Joshi	Samhitha & Siddantha U.G. & P.G. Padartha Vigyana & Ayurveda	Coordinator
12	Dr. G. P. Rama Reddy	Ithihasa	-
	Dr. Brij Kumar	Padartha Vigyana & Ayurveda	
13	Dwivedi	Ithihasa Padartha Vigyana & Ayurveda	
14	Dr. Milind Mokashi	Ithihasa Padartha Vigyana & Ayurveda	
15	Dr. Santhosh Nair	Ithihasa Padartha Vigyana & Ayurveda	
16	Dr. Ahalya Sharma	Ithihasa Padartha Vigyana & Ayurveda	
17	Dr. Suhag Rawal	Ithihasa	
	Dr. G. R. R	Padartha Vigyana & Ayurveda	
18	Chakravarthy	Ithihasa Padartha Vigyana & Ayurveda	
19	Dr. Nandani	Ithihasa Padartha Vigyana & Ayurveda	
20	Dr. Manoj Sharma	Ithihasa Padartha Vigyana & Ayurveda	
21	Dr. Mallika K. J.	Ithihasa Padartha Vigyana & Ayurveda	
22	Dr. Shubhangi K	Ithihasa	
23	Dr. Premchand Shastri	Sanskrit	Coordinator
24	Dr. Mohan Chand Bhat	Sanskrit	
25	P. V. Thothadrinathan	Sanskrit	
26	Dr. Nigam Sharma	Sanskrit	
27	Dr. Savitri G. S	Sanskrit	
28	Dr. B. K. Shyam Raw	Sanskrit	

2. RACHANA SHAARIRA

**Total Marks –
400**

PAPER-I (GARBHA SHAARIRA)

100 Marks

Etymology of Garbhavakranti Shaarira, features of Shukra and Shonita, description of Beeja, Beejbhaga, Beejbhagavyava and Garbhotpadakabhava, Garbha Poshana Krama, Garbhavriddhikar Bhav, Masanumashiki Garbhavridhi, Foetal circulation. Explanation of lakshana occurring in Ritumati, Sadhyah Grihita Garbha.

Yamal garbha, Anasthi garbha.

Explanation of Basic Embryology, and Systemic embryology.

Knowledge of basic facts in advancement in Anuvanshiki (Genetics) and Garbhajavikara (Teratology).

PAPER –II (KOSHTHANGA SIRA DHAMANI SROTAS SHAARIR) 100 Marks

Koshthanga Shaarira: - Detail etymological derivation of 'Koshtha' and Koshthanga, including detail study of structure of each Koshthanga. Male and Female genital organs.

Ashaya: - Definition, detail description.

Kala Shaarira:-Etymology, Definition, description of Seven Kala with their Modern component and applied aspects.

Paribhashika Shaarira: - Snayu, Kandara, Rajju, Sanghata, Jalaetc. and their general description.

Sira, Dhamani and Srotas Shaarira: - Etymological derivation, definitions, synonyms, number and types of Sira, Dhamani and Srotas, anatomical differences among Sira, Dhamani and Srotas, description of Vedhya and AvedhyaSira (Puncturable and Non puncturable Veins) and clinical importance of Sira, Dhamani and Srotas including Modern Anatomical counterparts.

PAPER –III (Marma Shaarira Evum Asthi Sandhi Peshee Shaarira) 100 Marks

1) Marma Shaarira:- Derivation and definitions of the term Marma and their features, characteristics and number of Marma according to Sushruta Divisions of Marma on morphological basis (Rachana Bheda), Shadangatvam (Regional), Abhighataja (Prognostic) classification, Trimarma according to Charaka. Knowledge of 'Marmaabhighata', MarmaViddha, Detailed study of individual marma with their clinical and Surgical importance. Importance of Marma in Shalyatantra.

Asthi Shaarira :- General introduction and description of Asthi, differences among number of Asthi.Types of Asthi. Detail study of each bone with its ossification &Applied anatomy.

Sandhi Shaarira :- Etymological derivation,description, features, number, types and Applied anatomy of all Sandhi (joints).

Peshee Shaarira :- Etymological derivation,description, features, number, types and Applied anatomy of all Peshee (Muscles).

PAPER – IV (Tantra Shaarira Evum Antah and BahihGranthi Vigyaniya)

100 Marks

Description of Panchgyanendriya – Ayurved and Modern aspects. (Sensory organs (Eye, Ear, Nose, Tongue and Skin with their Applied anatomy).

Shat Chakra - Location and significance in Yoga. Description of Ida, Pingala, Sushumnanadi.

Anatomy of brain and spinal cord, Peripheral nervous system (explanation of Nerve Plexuses and peripheral nerves, Cranial nerves and Autonomic nervous system, Cerebro-spinal fluid, Venous sinuses of Brain, Ventricular system of Brain, Blood supply of Brain, Meninges with Applied Anatomy.

AntahSraviGranthi and BahihSraviGranthi:-Detail study of Exocrine &Endocrine glands.

PRACTICAL:-

Dissection of atleast one cadaver during the Final part of the course.

Training of preservation techniques in the Embalming room.

Preparation of Soft tissue specimen and Models using current technology like Plastination, Lumen casting etc. under the guidance of Teaching staff and Experts of the relevant fields.

Preparation of Charts and Models of Rachana Shaarira subject to the individual capacity.

Observation of MRI, CT Scan, USG procedures, Colour Doppler etc.

Visits to various Museums of other colleges in the Medical field.

Observation of Ward procedures like Lumbar puncture, Tracheostomy, Abdominal parentesis, Liver biopsy, Venesection, etc. (subject to the availability and opportunities)

Pattern of Practical Examination

- | | |
|---|------------|
| 1. Practical record book& log book | - 20 Marks |
| 2. Spotting (Dissected organs and Bones-Joints-Muscles) | - 20 Marks |
| 3. Dissection | - 40 Marks |
| 4. Surface & Radiological Anatomy | - 40 Marks |
| 5. Dissertation Presentation | - 10 Marks |
| 6. Teaching Skills | - 20 Marks |
| 7. Viva-voce | - 50 Marks |

Reference Books-

- | | |
|-------------------------------------|-------------------|
| Relevant matters of Brihatrayee and | |
| 1. Laghutrayee | |
| 2. PratyakshaShariram | - GananathSen |
| | - Damodar Sharma |
| 3. AbhinavaShariram | Gaur |
| | - Damodara Sharma |
| 4. Parishadyam Sabdartha Shariram | Gaur |

- | | |
|--|------------------|
| 5. BrihatShariram | - P S Varier |
| 6. Shiva Samhita | |
| 7. Gray's Anatomy | - Latest Edition |
| 8. Human Anatomy | - B D Chaurasia |
| Cunnigham's Companion to Manual of Practical Anatomy.Vol I, II & | |
| 9. III | |
| | - Keith L Moore |
| 10. Developing Human | &Persaud |
| 11. Clinically oriented Anatomy | - Keith L Moore |
| 12. Clinically oriented Neuro Anatomy | - Richard Snell |
| 13. Surface and Radiological Anatomy | - Halim |
| 14. Grant's Methods of Anatomy | -Grant |
| 15. Grant's dissector | -Grant |
| 16. Human Embryology | -I. B. Singh |

4. DRAVYAGUNA VIGYAN

PAPER-I Namarupa Vigyana

100 marks

Importance of Namagyana of Dravya, origin of Namarupagyana of Aushadhi in Veda, etymological derivation of various names and synonyms of Aushadhi.

Rupagyana in relation to Aushadhi. Sthula and Sukshma description (Macroscopic and Microscopic study) of different parts of the plant.

Synonyms of dravyas(aushadha and Ahara) mentioned in Vedic compendia, Brihatrayee, Bhavaprakasha and Rajanighantu.

Basonyms, synonyms and distinguish morphological characteristic features of medicinal plants listed in Ayurvedic Pharmacopoeia of India(API).

Knowledge of Anukta dravya (Extrapharmacopial drugs)with regards to namarupa.

Sandigdha dravya(Controversial drugs) vinischaya.

Knowledge of biodiversity, endangered medicinal species.

Knowledge of TKDL, Introduction to relevant portions of Drugs and cosmetic act,

Magic remedies Act, Intellectual Property Right (IPR) and Regulations pertaining to Import and Export of Ayurvedic drugs.

Knowledge of tissue culture techniques

Knowledge of Genetically Modified Plants

PAPER –II Guna Karma Vigyan

100 marks

Fundamental principles of drug action in Ayurveda and conventional medicine.

Detailed study of rasa-guna- virya- vipaka-prabhava and karma with their applied aspects and commentators (Chakrapanidatta, Dalhana, Arunadatta, Hemadri and Indu) views on them.

Comprehensive study of karma as defined in Brihatrayee & Laghutrayee

Detailed study of Guna and Karma of dravyas listed in API and Bhavaprakasha Nighantu along with current research review.

Detailed study of aharadravya/ ahara varga ascribed in Brihatrayee and various nighantus along with Kritanna varga.

Pharmacological principles and knowledge on drugs acting on various systems.

Basic knowledge on experimental pharmacology for the evaluation of - analgesic, anti pyretic, anti inflammatory, anti diabetic, anti hypertensive, hypo lipidemic, anti ulcer, cardio protective, hepatoprotective, diuretics, adaptogens, CNS activities.

Knowledge on Heavy metal analysis, pesticidal residue and aflatoxins

Knowledge on evaluation of anti microbial and antimycotic activities.

PAPER – III Prayogavigyana

Marks 100

Bhaishjya Prayog Siddhant [Principles of drug administration] - Bhaishajya Marga (routes of drug administration), Vividha Kalpana (Dosage forms), Principles of

Yoga Vijnan(compounding), Matra (Dosage), Anupana (Vehicle), Aushadha grahankal (Time of drug administration), Sevankal avadhi (duration of drug administration), Pathyapathya (Dos' /Donts' /Contraindications), complete Prescription writing (Samagra Vyavastha patraka).

Samyoga- Viruddh Sidhanta and its importance

Amayika prayoga (therapeutic uses) of important plants ascribed in as well as Brihatrayee, Chakradutta, Yoga ratnakara and Bhavaprakasha. Knowledge of Pharmaco-vigilance in Ayurveda and conventional system of medicine.

Knowledge of clinical pharmacology and clinical drug research as per GCP guide lines.

IKnowledge of Pharmacogenomics

**PAPER- IV
marks**

100

Etymology of nighantu, their relevance, utility and salient features.

Chronological history of the following Nighantus with their authors name, period and content- Paryaya ratnamala, Dhanvantari nighantu, Hridayadipika nighantu, Ashtanga nighantu, Rajanighantu, Siddhamantra nighantu, Bhavaprakasha nighantu, Madanpala nighantu, Rajavallabha nighantu, Madhava Dravyaguna, Kaiyadeva nighantu, Shodhala nighantu, Saligram nighantu, Nighantu ratnakara, Nighantu adharsha and Priya nighantu

Detailed study Aushadha kalpana mentioned in Sharangadhara samhita and Ayurvedic Formulary of India (AFI).

General awareness on poshaka ahara(Nutraceuticals),Varnya(cosmoceuticals), food additives, Excipients etc.

Knowledge of plant extracts, colors, flavors and preservatives.

Review of important modern works on classical medicinal plants published by Govt of India, department of AYUSH and ICMR.

Syllabus of the Practical training of part two M.D. (Ayu) -

Dravyaguna Practical:-

Study tours:

Field identification of medicinal plants through at least three local Dravyaguna study tours within the state and one study tour out of state. Preparation of minimum 50 herbarium sheets, along with raw drug either from field, of plants be collected during study tours.

Evaluation of Crude drugs:

Macro and microscopic methods of examining five drugs of each of different useful parts of plants, including their powders.

Phytochemical evaluation of raw material:

Quantitative standards like foreign matter, extractive (water and alcohol), ash value, acid insoluble ash and TLC separation of various parts of minimum two plants of Ayurvedic Pharmacopoeia of India.

Yoga vijnana :

Preparation of two yoga of each kalpana of Ayurvedic Formulary of India:

Pharmacology:

Rasa nirdharana by Taste Threshold method of minimum one drug for each of rasas.

Observation of animal experimentation models (both in vitro and in vivo)- 05 models for possible rasadi gunas.

Clinical

Regular clinical training in the hospital for submission of Single Aushadhi Prayoga (Single drug trial/ Clinico-pharmacological studies.)
Survey for Amayika prayoga of aushadhi(Pharmaco epidemiology) for

studying their role in clinical practice in contemporary period -
observational study-minimum.

Dissertation

A Dissertation, as per the approval of Departmental Research Committee/Competent Committee for the purpose, be prepared under the guidance of approved supervisor

in Dravyaguna and submitted 6 months before the final examination. The approval of Dissertation shall be essential before appearing the final examinations.

Method of practical training – Posting for minimum one month in each of the following units -

Quality control laboratory of nearest pharmacy/institution for crude drug identification, adulterants and substitutes & understanding standardization techniques.

Experimental pharmacology laboratory for developing skills in animal experimentation

Regular clinical training in the Teaching hospital for studying Ekala Aushadhi Prayoga & Adverse drug reactions(ADR).

Post Graduate Scholar is expected to present minimum two scientific papers in National / international seminars during the course of study

Post Graduate Scholar is expected to publish / get accepted at least one paper in indexed/ peer reviewed journal under the supervision of guide.

Pattern of Practical Examination-

Total =200 marks

1. Herbarium	- 10 Marks
2. Pharmacognosy practical record	- 10 Marks
3. Pharmacology practical record	- 10Marks
4. Clinical records record	- 10 Marks
5. Practical examination(Identification of green and raw drugs, microscopic examination, Ekala aushadha pariksha	- 60 Marks
6. Thesis Presentation	- 20Marks
7. Viva voce	- 80 Marks

Reference books -

KAUMARBHRITYA-BALA ROGA

PAPER – I Bija, Garbha Vigyaniya (Human Genetics, Embryology) Marks: 100

A. Prakrita Bija-Bijabhaga-Bijabhagavayava evam Tadjanya Vikriti (Genetics and related disorders)

Ayurvedic genetics with modern interpretations: Shukra, Shonita, Shukra Shonita Doshas, Bija-Bijabhaga-Bijabhagavayava Vikriti, Matrija and Pitraja Bhavas, Yajjah Purushiya and Atulyagotriya; Measures for obtaining good progeny.

Modern
genetics Basic
concepts:

Cell, cell division, nucleus, DNA, chromosomes, classification, karyotype, molecular and cytogenetics, structure of gene, and molecular Screening.

Human Chromosomes - Structure, number and classification, methods of chromosome preparation, banding patterns.

Single gene pattern inheritance: Autosomal & Sex chromosomal pattern of inheritance, Intermediate pattern and multiple alleles, Mutations, Non Mendelian inheritance, mitochondrial inheritance, Genomic imprinting, parental disomy.

Criteria for multi-factorial inheritance.

Pathogenesis

Pathogenesis of chromosomal aberrations and their effects, recombinant DNA, genetic inheritance, inborn errors of metabolism

Chromosomal abnormalities: Autosomal & Sex chromosomal abnormalities, syndromes

Multifactorial pattern of inheritance: Teratology, Cancer Genetics – Haematological malignancies, Pharmacogenetics.

Chromosomal disorders

Chromosomal aberration (Klinefelter, Turner and Down's syndrome

Genetic Counseling, Ethics and Genetics.

B. Prakrita Bija-Bijabhaga-Bijabhagavayava evam Tadjanya Vikriti (Genetics and related disorders)

Garbha (embryo), Garbhawastha (gestation period), sperm, ovum; spermatogenesis; oogenesis; structure of ovum

Sperm in the male genital tract; sperm in the female genital tract, activation and capacitation of sperm.

Garbha Masanumasika Vriddhi evam Vikasa (Ayurvedic and modern concepts of Embryo and Fetal development)

First week of development

Second week of development

Third week of development

Fourth to eighth week of development (Embryonic period)

Development from third month till birth (Fetal period)

Formation of Prakriti, their assessment in children viz. Bala, Kumara, Yauvana; Pathya-Apathya according to Prakriti.

Apara (Placenta) Apara Nirmana (Formation of placenta), Apara Karya (Functions of placenta); Apara Vikara (Placental abnormalities)

Nabhinadi (Umbilical Cord)

Formation and features of umbilical cord

Garbha Poshana (Nutrition- from conception to birth)

Yamala Garbha(twins)

Garbha Vriddhikara Bhavas, Garbhopaghatkara Bhavas.

Effect of maternal medication, diet and illness over fetus.
Teratology including defects of bija, atma karma, kal, ashaya etc.:
causative factors for teratogenecity, mode of actions of teratogenes,
critical periods

Perinatal Care and Perinatal complications
Scientific study of Jataharini specific to children.

Prenatal diagnosis

Samanya Janmajata Vikara (Common congenital anomalies of different systems): Sahaja Hridaya Vikara (Congenital Cardiac Disorders)
Jalashirshaka (Hydrocephalus), Khandaoushtha (cleft lip), Khanda-Talu (cleft palate), Sanniruddha Guda (Anal stricture / imperforated anus), Pada-Vikriti (Talipes equinovarus and valgus), Tracheoesophageal Fistula (TOF), Spina bifida, Meningocele, Meningomyelocele, Pyloric Stenosis.

**PAPER-II Navajata Shishu Vigyan evam Poshana
100**

Marks:

PART-A

Navajata Shishu Paribhasha, Vargikarana (Important definitions and classification related to neonates.)

Navajata Shishu Paricharya evam Prana-Pratyagamana (Care of the newborn including recent methodology for the resuscitation)

Samanya Navajata Shishu Paricharya (General Neonatal Care –Labour room onwards)

Samaya purva evam Samaya pashchat Jata Shishu Paricharya (Management of preterm, post term and IUGR newborn)

Prasava Kalina Abhighataja Vyadhi (Birth injuries): Upashirshaka (Caput , cephalohematoma), Bhagna (Fractures), Mastishkantargata Raktasrava (ICH, IVH, Subdural hemorrhage)

Navajata Shishu Parikshana (Examination of new born): Ayu Parikshana (including Lakshanadhyaya) Modern approach of Neonatal Examination including gestational age assessment

Kumaragara: Navajata Shishu Kaksha Prabandhana (Nursery management), NICU, Nursery plan, staff pattern, medical records, Visankramnikarana (sterlization), Knowledge of equipments used in nursery.

PART-B

8. Navajata Shishu Vyadhi (Early neonatal disorders): Hypothermia, Shvasavarodha (Asphyxia Neonatorum/Respiratory distress), Ulvaka (Aspiration pneumonia), Rakta Vishamayata (Neonatal septicemia), Kamala

(Neonatal Jaundice), Akshepaka (Neonatal convulsion), Pandu (Anemia), Atisara (Diarrhea), Asamyaka Nabhinal kartanjanya vyadhi.

Navjata Kshudra Vikara (Minor neonatal ailments): Chhardi (Vomiting), Vibandha (constipation), Udara shul (Infantile colic), Puya Sphota (Pyoderma), Shishu Netrabhishyanda (Ophthalmia neonatorum).

Sadyojatasya Atyayayika Chikitsa (Management of neonatal emergencies): Shock, Fluid and electrolyte imbalance, Convulsion, Hemorrhagic diseases of Newborn etc.

Procedures: Shiro-Pichu, Abhyanga, Parisheka, Pralepa, Garbhodaka Vamana (Stomach wash), Ashchytana Neonatal resuscitation techniques, Blood sampling, Intravenous canulation, Umbilical vein catheterization, Bone marrow aspiration, Phototherapy, Naso-Gastric tube insertion, Urethral catheterization, Exchange blood transfusion, Thoracocentesis, Bone marrow infusion, Lumbar puncture

Nutrition:

A. Navjat Shishu Ahara (Neonatal feeding):

Specific Feeding methodology as per Ayurveda and recent advances; Day to day fluid, milk, caloric requirement for the newborn, feeding technique for the preterm baby.

Stanyotpatti and Prasaruti (Lactation physiology), Stanya Samghatana (Composition of breast milk), Stana Sampat (Characteristics of normal breast), Stanya Sampata evam Mahatva (Properties & importance of pure milk), Stanya-Piyusha (Colostrum); Stanya-Pana-Vidhi (Method for breast milk feeding), Stanyakshaya / Stanyanasha (Inadequate production and absence of breast milk), Stanya parikshana (Examination of breast milk), Stanyabhava Pathya Vyavastha (Alternative feeding methods in absence of breast milk), Various feeding methods, TPN(Total Parenteral Nutrition)

Stanyadosha (Vitiation of Breast milk), Stanya Shodhana (Purification of breast milk), Stanya Janana and Vardhanopakrama (Methods to enhance breast milk formation) Dhatri (Wet nurse): Dhatri Guna and Dosha (Characteristics of Wet nurse), Concept of Breast Milk Banking. Lehana (Elucturies)

Bala-Poshana (Child Nutrition):

Daily requirements of nutrients for infant and children

Common food sources

Satmya and Asatmya Ahara (Compatible and incompatible diet)

Pathya evam Apathya Ahara (Congenial and non-congenial diet)

Stanyapanayana (Weaning)

PAPER-III Balrog (Pediatric Disorders)
100

Marks:

PART-A

Pranvaha Srotasjanya Vyadhi (Respiratory disorders)- Kasa (Cough), Shvasa (Respiratory distress Syndrome), Tamaka Shwasa (Childhood Asthma), Bronchiolitis, Shvasanaka Jwara (Pneumonia- bacterial, viral etc) Rajyakshma (tuberculosis), Vaksha-Puyata (Pyothorax), Vaksha Vata-Purnata (Pneumothorax)

Annavaha Srotasjanya Vyadhi (Gastrointestinal disorders): Jwar (Fever), Chhardi (Vomiting) Ajirna (Indigestion), Kshiralsaka, Atisara (Diarrhea), Pravahika, Vibandha (Constipation, Udarshula (Pain in abdomen), Guda bhramsh (Rectal prolapse)

Rasa evam Raktavaha Srotasjanya Vyadhi (Hematological and circulatory disorders): Pandu (Anemia and its various types like Nutritional, haemolytic etc.) and , Raktapitta (Bleeding disorders), Vishishta Hridrog (Specific cardiac diseases- RHD etc), Hypertension, Leukemia.

Mamsavaha Srotasjanya Vyadhi: Myopathies

Mutravaha srotasjanya Vyadhi (Urinary System disorders): Vrikkashotha (Glomerulonephritis and nephrotic syndrome), Mutrakriccha (Dysuria), Mutraghata (Anuria),

Vatavaha Sansthanjanya Vyadhi (Nervous system disorders): Apasmara (Epilepsy), Mastulunga-Kshaya, Mastishka-Shotha (Encephalitis), Mastishkavrana-Shotha (Meningitis),

Pediatric disabilities and Rehabilitation: Cerebral palsy, Ardita (Facial paralysis), Pakshavadha (Hemiplegia), Ekangaghata (Monoplegia), Adharanga Vayu (diplegia), Amavata (Juvenile Rheumatoid arthritis)

Manovaha Srotasa Vyadhi: Breath holding spell, Shayya mutra (Bed wetting), Autism, ADHD (Attention Deficit and hyperactive disorders), Learning Disability, Mental retardation, Temper tantrum, Pica.

PART-B

Antahsravi evam Chayapachayajanya Rog (Endocrine and Metabolic disorders)

Kuposhanjanya Vyadhi (Nutritional disorders): Karshya-Phakka-Balshosha-Parigarbhika (PEM and allied disorders), Vitamin-mineral and trace elements deficiency disorders, Hypervitaminosis,

Krimi evam Aupsargika Rog (Infestations and Infections): Krimi (Giardiasis and intestinal helminthiasis, Amoebiasis) Common bacterial, viral infections with special reference to vaccine-preventable diseases: Rohini (Diphtheria), Whooping cough, Aptanaka (Tetanus including neonatal tetanus), Romantika (Measles), Karnamula Shotha (Mumps), Rubella and Masurika (Chickenpox), Antrika Jwar (Typhoid and Paratyphoid), Viral Hepatitis,,; Vishama Jwar (Malaria) and Kala-azar, Dengu fever, HIV (AIDS), Poliomyelitis, Mastishkavaran Shotha (Meningitis), Mastishka Shotha (Encephalitis), Chickengunia

Tvaka Vikara (Skin disorders): Ahiputana (Napkin Rashes), Shakuni (Impetigo), Sidhma, Pama, Vicharchika, Charmadal (Infantile atopic dermatitis), Gudakutta.

Anya Vyadhyi (Miscellaneous disorders): Jalodar (Ascites), Gandamala, Apachi (Cervical lymphadenitis), Kukunakadi Akshi Rog, Hodgkin & non-Hodgkin Lymphoma, Abnormal growth patterns, Short stature , Niruddha prakash (Phimosis), Paridagdha Chhavi, Utpullika

Samghata- Bala Pravrita Rog (damstra): Dog bite. Snake bite, Scorpion bite etc

Atyayika Balarog Prabandhana (Pediatric emergency management): Shock and Anaphylaxis, Fluid and electrolyte management, Drowning, Foreign body aspiration, Status epilepticus, Acute hemorrhage, Acute renal failure, Febrile convulsion, Status asthmaticus, Burn, Acute Poisoning

Balagraha: Scientific study of Graha Rogs

Life Style disorders

PAPER-IV Kaumarabhritya in Ancient Classics and recent Advances Marks: 100

Significant contributions of Kashyapa samhita, Arogya raksha Kalpadrum and other texts /treatises of Ayurveda such as Harita Samhitain the field of Kaumarbhritya including relevant parts from Brihatrai

Panchakarma: Principles of Panchakarma [Swedan–Hasta–Pata sweda etc], and their application in pediatric practice in detail.

Update knowledge of clinical pediatrics including recent researches in Kaumarbhritya.

Fundamentals of Hospital management with special emphases on Pediatric Ward.

Practical/ Clinical Exposure for (Record of exposures to be produced at the practical examination)

Full term, preterm, post term new born baby care
Practical procedures like – phototherapy, premature baby care, KMC, venepuncture, cord blood sampling, stomach wash, suction, resuscitation, etc.

Practical skill of Pediatric Panchakarma procedures
Child Health Check up

IQ Assessment of Children
Exposure to National Health Programs related to Children, including Immunization Program.

Patient case Records (50 Records)
Practical knowledge of modern diagnostic (invasive & non invasive) tools and techniques used in pediatrics.

Management of common pediatrics emergencies.
Participation in UG teaching/training from UG syllabus via A-V aids (minimum-3)

Minimum 15 days compulsory reciprocal exposures in Kaumarbhritya department of other institution during the study period.
Participation in National/international seminars

Publication/acceptance of two research papers in indexed/peer reviewed/ISSN journals from the dissertation.

Pattern of practical examination:

- | | |
|--|-----------|
| 1. Case record | -15 marks |
| 2. Bed side examination | |
| a) Short Case | -15 Marks |
| b) Long Case | -25 Marks |
| 3. Identification of instruments/ spotting | -10 Marks |
| 4. Lecture/Dissertation Presentation | -10 Marks |
| 5. Viva-voce | -25 Marks |

Reference Books

Kashyapa Samhita Complete Hindi translation by Satyapal Vidhyalankara
English translation by Prof. Premvati Tiwari

Principles & practice of Pediatrics in Ayurveda: CHS Shastry

Child Health Care in Ayurveda: Abhimanyu Kumar

Ayurvedic Concepts of human Embryology: Abhimanyu Kumar

Kaumarbhritya by Prof. D.N. Mishra

Kaumarbhritya Ke Antargata Balgraho Ka Kramika Evam Vaigyanika Adhyana by Prof. Chanchal Sharma

Notes on Kaumarbhritya-by Dr. Dinesh K S

Pran - Pratyagamanam-by Dr. B.M. Singh

Ayurveda Dwara Matra Evam Shishu Paricharya by Dr. KS Patel, V.K. Kori & Rajgopal

S

Kaumarbhritya related references from Charaka Samhita, Sushruta Samhita Vagbhata etc.

Clinical Methods in Paediatrics by Meharban Singh

Pediatrics Emergencies by Meharban Singh

Essential Pediatrics O.P. Ghai

Text Book of Pediatrics Nelson

Care of New Born by Meharban Singh
