3. KRIYA SHARIR

Theory – 400 marks (100 each)
Practical and Viva-Voce – 100 marks

Paper – I
100 Marks

DOSHA-DHATU-MALA-VIDHNYANA

Contribution of different Ayurveda Samhita in Kriya Sharir

• Theory of Panchamahabhuta
• Principle of Loka-Purusa Samya
• Importance of Samanya-Vishesha principle
• Different views on the composition of Purusha and importance of Chikitsya Purusha.
• Importance of Gurvadi Guna in Ayurveda.
• General description of Tridosha theory.
• Mutual relationship between Triguna-Tridosha-Panchamahabhuta-Indriya.
• Mutual relationship between Ritu-Dosa-Rasa-Guna.
• Biological rhythms of Tridosha on the basis of Day-Night-Age-Season and Food intake.
• Role of Dosha in the formation of prakriti of an individual.
• Role of Dosha in maintaining health.
• Strotasa Vidnyana-physiological and clinical significance of strotasa, their properties, features, numbers & types.
• Vata Dosha: General locations (Sthana), general attributes (Guna) and general functions (Samanya Karma). Five subdivisions of Vata with their specific locations, specific properties and specific functions (Prana, Udana, Samana, Vyana, Apana)
• Pitta Dosha: General locations (Sthana), general attributes (Guna) and general functions (Samanya Karma). Five subdivisions of Pitta with their specific locations, specific properties, and specific functions (Pachaka, Ranjaka, Alochaka, Bhrajaka, Sadhaka). Similarities and differences between Agni and Pitta.
• Kapha Dosha: General locations (Sthana), general attributes (Guna) and general functions (Karma) of Kapha. Five subdivisions of Kapha with their specific locations, specific properties, and specific functions (Bodhaka, Avalambaka, Kledaka, Tarpaka, Shleshaka).
• Applied physiology of Tridosha principle: Kriyakala, Dosha Vriddhi-Dosha kshaya.
Modern laboratory, Ayurvedic and clinical methods to assess the functional mechanism of Dosha, *Biochemical basis of Tridosha and its applicability.*

- **Dhatu Poshana**: Process of nourishment of Dhatu. Description of various theories of Dhatu poshana (kshira-dadhi, kedari-kulya, khale kapota etc) and its clinical application.

- **Dhatu**: General introduction and definition of dhatu. Formation, definition (Nirukti), Distribution, Attributes, quantity, classification, pancabhumika composition and functions of all seven Dhatus in detail: Rasa, Rakta, Mamsa, Meda, Asthi, Majja, Shukra.

- Applied physiology of dhatu: Manifestations of ksaya and vriddhi of each Dhatu. Description of Dhatu pradoshaja vikara. Modern laboratory, Ayurvedic and clinical methods to assess the functional mechanism of dhatu.

- Description of Ashraya and Ashrayi kind of relationship between Dosha and Dhatu and its clinical application.

- Description of the characteristic features of Ashtavidha Sara and its clinical application. Description of Rasavaha, Raktavaha, Mamsavaha, Medovaha, Asthivaha, Majjavaha and Shukravaha Srotamsi.

- **Ojas**: Definition, locations, synonyms, formation, distribution, properties, quantity, classification and function of ojas. Description of Vyadhikshamatva, Balavrddhikara Bhava. Classification of Bala. Relation between Shlesma, Bala and ojas.


- **Upadhatu**: General introduction and definition of the term ‘upadhatu’. Formation, Nourishment, Quantity, Properties, Distribution and functions of each upadhatu.

- **Stanya**: Characteristic features and methods of assessing suddha and Dusita Stanya, manifestations of vrddhi and ksaya of syanya.

- **Artava**: Characteristic features of Shuddha and Dushita Artava. Differences between Raja and Artava, physiology of Artavavaha Srotamsi.

- **Study of Tvak**

- **Physiology of Mala**: Definition of the term ‘Mala’. Definition, formation, properties, quantity and functions of Purisha, Mutra. Manifestations of vrddhi and kshaya of Purisha and Mutra.
• Sweda – Definition, Formation, Properties, Quantity and Functions of Swedavaha Srotamsi. Formation of Sweda. Manifestations of vriddhi and kshaya of sweda.
• Dhatumula – Definition, Formation, Properties Quantity, Classification and Functions of each Dhatumala.

**Paper – II**

**PRAKRTI - SATTVA VIDHNYANA**

- Deha – Prakriti: Various definitions and synonyms for the term ‘Prakriti’. Factors influencing the Prakriti. Classification of Deha-prakriti. Characteristic features of the individuals belonging to each kind of Deha-prakriti and its clinical application. Recent advances in understanding the Prakriti. Role of prakriti in career guidance and match making

  Concepts of somatotypes, psychological traits, classification of personality.

- Manas Prakriti: Types of Manas prakriti with their characteristic features and its practical implication, properties of Sattva, Rajas, Tamas and their effect on mind.

- Panchadhnyanendriya: Physiological description of panchadhnyanendriya and physiology of perception of Shabda, Sparsha, Rupa, Rasa, Gandha. Indriya-pancha-panchak; physiological description of karmendriya.


- Buddhi – Location, types, Functions of Buddhi; physiology of Dhi, Dhriti and Smriti.

- Nidra – Definition of Nidra, classification of Nidra. Tandra, physiological and clinical significance of Nidra; Svaapnotpatti and Svaapnabheda.

- Physiology of Special Senses.

- Physiology of Intelligence, Memory, Learning and Motivation.

- Physiology of Sleep.

- Physiology of Speech and Articulation.

- Physiology of Pain and Temperature.
Paper – III
KOSHTHANGA KRIYA VIDHNYANA

- Ayurvedic and modern physiological study, Histology and functional importance of different koshthanga like liver, spleen, heart etc.
- Koshtha : Definition of term Koshtha. Physiological classification of koshtha and characteristics of each kind of koshtha.
- Description of aetiology and features of Annavaha Srotodushti. Applied physiology of Annavaha Srotas ; Arochaka,Ajirna,Atisara,Grahami,Chhardi,Parinama Shula Agnimandya.
- Description of process of digestion of fats, carbohydrates and proteins in human gastrointestinal tract. Different digestive juices, their enzymes and their mechanism of action. Functions of Salivary glands, Stomach, Pancreas, Small intestine, Liver and Large intestine in process of digestion and absorption.
- Movements of gut (deglutition, peristalsis, defecation etc.) and their control. Role of Neuro-endocrine mechanism in process of digestion and absorption. Enteric nervous system.
- Applied physiology of gastrointestinal tract: Vomiting, Diarrhoea, Malabsorption, Belching etc.
- Recent understandings related to the gut microbiota and their role in health and disease.
- Introduction to biochemical structure, properties and classification of proteins, fats and carbohydrates.
- Description of the processes involved in the metabolism of proteins, fats and carbohydrates.
- Vitamins: sources, daily requirement and functions, physiological basis of signs and symptoms of hypo and hyper-vitaminosis.

**Paper – IV 100 Marks**

**MODERN PHYSIOLOGY AND ITS APPLIED ASPECT**

**General Physiology:**

**Physiology of Neuro-Immune-Endocrine Mechanisms:**
- Physiology of Nervous System. General introduction to nervous system: neurons, mechanism of propagation of nerve impulse.
- Study of CNS, PNS and ANS. Sensory and motor functions of nervous system. Functions of different parts of brain and spinal cord, Hypothalamus and limbic system.
- Physiology of Endocrine system. Classification and characteristic of different hormones. Description of hormones secreted by Hypothalamus, Pituitary gland, Thyroid gland, parathyroid gland, Pancreas, Adrenal glands and their physiological effects. Effects of hypo and hyper-secretion of various hormones.
- Physiology of Immune system. Definition and classification of immunity: Innate acquired and artificial. Mechanisms involved in humoral and cell mediated immunity.
- Cardiovascular physiology, Respiratory physiology and Blood:

- Functions of Haemopoetic system: Composition and functions of blood and blood cells. Haemopoiesis- (Stages and development of RBCs, WBCs and platelets); Introduction to bone marrow: composition and functions of bone marrow. Structure and functions of haemoglobin, mechanism of blood clotting, study of platelets. Physiological basis of blood groups. Principles of blood transfusion, plasma proteins-synthesis and functions. Applied physiology: Anaemia, Jaundice. Musculoskeletal physiology:

- Physiology of muscles. Classification of muscles. Electrical and mechanical properties of Cardiac, skeletal and smooth muscles. Physiology of Excretion:


- Structure and functions of skin, sweat glands and sebaceous glands.

**Physiology during special states:**

- Space physiology
- Exercise physiology
- Physiology of high altitude and deep sea
- Physiology of yoga
- Physiological response to environmental changes
- Physiological response to Vega Vidharana (Holding Natural urges)
- Sports physiology

Learners should be well versed with the following instruments-

- Physiograph, Computerized spirometry, Biochemical Analyzer, Pulse oxymeter, ELISA Reader, Hematology Analyzer, Tread mill etc. Bridge areas including recent advances:

- Recent studies in biorhythms.
- Recent advances in Neuro-Immune-Endocrine physiology.
Recent advances in understating the prakruti Brief description related to some of the recent studies exploring the genetic/biochemical/haematological/electrophysiological basis for prakruti Introduction to recent tools to assess prakruti (questionnaires and various parameter software)

Recent advances in tissue engineering and stem cell research.

PRACTICAL

Ayurvedic Practicals

- Assessment of Prakriti
- Assessment of Sara
- Assessment of Dosha Vridhi Khsaya Lakshana
- Assessment Dhatu Vridhhi-Kshaya Lakshana
- Assessment of Agni
- Assessment of Koshtha
- Assessment of Sharira Balā through Vyayama Shakti
- Mutra Pariksha
- Nadi Pariksha
- Anguli Pramana
- Assessment of Satmya
- Assessment of Sattva
- Assessment of Samhanana
- Assessment of Vaya
- Assessment of Aayu
- Assessment of Dosha karya
- Assessment of Dhatu karya
- Assessment of Mala Karya
- Purisha Pariksha

Haematology & Biochemistry

- Use and care of compound microscope
- Histological study of different organs
- Hemoglobin estimation
- Total RBC count
- Total WBC count
- Differential Leukocyte count
- Packed cell volume (PCV)
- ESR
- Bleeding time
- Clotting time
- Blood grouping, Rh typing, cross matching
- Semen Analysis
- Stool Examination
- **Estimation of BSL**
- **Kidney function Test**
- **Liver Function Test**
  - **Estimation of Serum Cholesterol**
  - **Estimation of Serum Calcium**
  - **Estimation of Serum Bilirubin**

**URINE EXAMINATION**

Physical, Chemical and Microscopic examination
- Specific gravity and reaction of urine
- Detecting the presence of Albumin in urine
- Detecting the presence of Sugar in urine
- Detecting the presence of Ketone bodies in urine
- Detecting the presence of Bile salts & bile pigments in urine
- **Detecting the presence of pus cell, caste etc. in urine.**

**Cardio – Vascular System**
- Clinical methods of examining cardiovascular system
- Examination of Arterial pulse.
- Arterial blood pressure measurement: Effect of posture, exercise and cold pressor test on Blood Pressure
- ECG recording and its interpretation
- Heart Sounds

Respiratory system
- Clinical examination of Respiratory System
- Lung Function Tests including Spirometry

Nervous System
- Clinical examination of nervous system
- Examination of higher mental functions
- Examination of cranial nerves
- Examination of reflexes
- Examination of sensory functions
- Examination of motor function
- Examination of Autonomic Nervous System
- ECG recording (Demonstration)

Requirements to be fulfilled before final examination:
- **At least 10 theory classes for First Prof. BAMS Students**
- **Participation and presentation of papers in at least 2 National / International Seminars.**
- **Publication/acceptance of at least 1 research paper/article in a scholarly journal.**
- **Departmental Presentation – at least 20 per student.**

**Practical Marks Distribution**

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<td>Modem Practical</td>
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<td><strong>Total Marks</strong></td>
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Reference Books

- Practical Physiology - C.L. Ghai
- Textbook of medical laboratory Technology - P.B. Godkar & D.P. Godkar
- Ayurvediya Kriya Sharir - Ranjit Rai Desai
- Kayachikitsa Parichaya - C. Dwarikanath
- Prakrit Agni Vigyan - C. Dwarikanath
- Sharir Kriya Vigyan - Shiv Charan Dhyani
- Abhinava Sharir Kriya Vigyana - Acharya Priyavrata Sharma
- Dosha Dhatu mala Vigyana - Shankar Gangadhar Vaidya
- Prakrit Dosha Vigyana - Acharya Niranjana Dev
- Tridosha Vigyana - Shri Upendranath Das
- Sharira Tatva Darshana - Hirlekar Shastri
- Prakrit Agni Vigyan - Niranjana Dev
- Deha Dhatvagni Vigyana - Vd. Pt. Haridatt Shastri
- Sharir Kriya Vigyana (part 1 and 2) - Acharya Purchandra Jain
- Sharir Kriya Vigyana - Shri. Moreshwar Dutt
- Sharir Kriya Vijnana (part 1 and 2) - Nandini Dhargalkar
- Dosha dhatu Mala vigyana - Basant Kumar Shrimal
- Abhinava Sharir Kriya Vigyana - Dr. Shiv Kumar Gaur
- Pragyogik Kriya Sharira - Acharya P.C. Jain
- Kaya Chikitsa Parichaya - Dr. C. Dwarikanath
- Concept of Agni - Vd. Bhagwan Das
- Purush Vichaya - Acharya V.J. Thakur
- Kriya Sharir - Prof. Yogesh C. Misra.
- Sharir Kriya Vigyana - Prof. Jayaram Yadav & Dr. Sunil Verma

- Basic Principle of Kriya Sharir
  (A treatise on Ayurvedic Physiology) - Dr. Shrikant Kumar Panda.
- Sharir Kriya – Part I & II - Dr. Ranade, Dr. Deshpande & Dr. Chobhe
- Human Physiology in Ayurveda - Dr. Kishor Patwardhan
- Sharirkriya vignyan practical Hand book - Dr. Ranade, Dr. Chobhe, Dr. Deshpande
- Sharir Kriya Part I - Dr. R.R. Deshpande, Dr. Wavhal
- Sharir kriya Part II - Dr. R.R. Deshpande, Dr. Wavhal
- Textbook of physiology - Gyton & Hall
- Review of medical physiology - William Ganong
- Essential of Medical Physiology - Sembulingam
- Concise Medical Physiology - Chaudhari, Sujit K.
- Fundamental of Anatomy & physiology - Martini
- Principals of Anatomy & Physiology - Tortora & Grabowski
- Human Physiology - Richards, Pocock
- Samson Wrights Applied physiology, Keele - Neil, joels
- Brainstem Control of Wakefulness and Sleep - Steriade, Mirce
- An Introduction to Human Physiology - Green, J.H.
- Ancient Indian Medicine - Kutumbiah P.
- Biographical History of Indian Medicine - Srikanthamurthy KR
- Ayurveda Kriya Sharira - Yogesh Chandra Mishra
- Textbook of Medical Physiology - Indu Khurana
- Tridosha Theory - Subrahmanya Shastri
- Statistics in Medicine - K. Syamalan
- Prayogika Sharir Kriya - Prof. M.S., Meena & Dr. Mahendra Prasad

Important Journals to refer:
- Advances in physiology Education
- Academic Medicine
- Indian Journal of Physiology and Pharmacology
- Journal of Ayurveda and Integrative Medicine
- Evidence-based Complementary and Alternative Medicine
- AYU
- All journals of American Physiological Society
- Journal of Physiology

Important Research Papers to refer:


3. KRIYA SHARIR

Additional points in existing syllabus

Paper – I (DOSHA-DHAȚU-MALA-VIDHNYANA)
- Biochemical basis of Tridosha and its applicability
- Clinical application of various theories of Dhatu poshana (kshira-dadhi, kedari-kulya, khale kapota ets)
- Clinical application of Ashraya and Ashrayi relationship between Dosha and Dhatu
- Clinical application of Ashtavidha Sara

Paper – II (PRAKRĪTI - SATTVA VIDHNYANA)
- Deha – Prakriti:
  Clinical application. Role of prakriti in career guidance and match making

Paper – IV (MODERN PHYSIOLOGY AND ITS APPLIED ASPECT)
- Physiology during special states:
  - Space physiology
  - Exercise physiology
  - Physiology of high altitude and deep sea
  - Physiology of yoga
  - Physiological response to environmental changes
  - Physiological response to Vega Vidharana (Holding Natural urges)
  - Sports physiology

PRACTICAL

Ayurvedic Practicals
- Assessment of Sattva
- Assessment of Samhanana
- Assessment of Vaya
- Assessment of Aayu
- Assessment of Dosha karya
- Assessment of Dhatu karya
- Assessment of Mala Karya
- Purisha Pariksha
Haematology & Biochemistry

- Estimation of BSL
- Kidney function Test
- Liver Function Test
- Estimation of Serum Cholesterol
- Estimation of Serum Calcium
- Estimation of Serum Bilirubin

Urine Examination

- Detecting the presence of pus cell, caste etc. in urine.

Dr. Hemangini Waghule
Professor & HOD
Dept of Kriya Sharira