

### 3. KRIYA SHARIR

Theory- 400 marks(100 Each)  
Practical and Viva-Voce - 100 marks

PAPER-I

100 Marks

#### DOSA-DHĀTU-MALA VIJÑĀNA

##### **Contribution of different Ayurveda Samhita in Kriya Sharir**

- Theory of Pancamahābhūta
- Principle of Loka-Purusa Sāmya
- Importance of Sāmānya - Viśesa principle.
- Different views on the composition of Purusa and the importance of Cikitsya Purusa.
- Importance of Gurvādi Guna in Ayurveda.
- General description of Tridosa theory
- Mutual relationship between Triguna-Tridosa-Pancamahābhūta-Indriya.
- Mutual relationship between Ritu-Dosa-Rasa-Guna.
- Biological rhythms of Tridosa on the basis of Day-Night-Age-Season and Food intake.
- Role of Dosa in the formation of Prakṛti of an individual.
- Role of Dosa in maintaining health.
- Strotasa vidvāna-Physiological and clinical significance of strotasa, their properties, features, numbers & types
- **Vāta Dosa:** General locations (*Sthāna*), general attributes (*Guna*) and general functions (*Sāmānya Karma*). Five subdivisions of *Vāta* with their specific locations, specific properties, and specific functions (*Prāna, Udāna, Samāna, Vyāna, Apāna*)
- **Pitta Dosa:** General locations (*Sthāna*), general attributes (*Guna*) and general functions (*Sāmānya Karma*). Five subdivisions of *Pitta* with their specific locations, specific properties, and specific functions (*Pācaka, Ranjaka, Ālocaka, Bhrājaka, Sādhaka*). Similarities and differences between *Agni* and *Pitta*.
- **Kapha Dosa:** General locations (*Sthāna*), 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, Ślesaka*).
- Applied physiology of Tridosa principle: *Kriyākāla, Dosa Vrddhi-Dosa Ksaya*. Modern laboratory, Ayurvedic & clinical methods to assess the functional mechanism of dosha.
- **Dhātu Posana:** Process of nourishment of *Dhātu*. Description of various theories of *Dhātu Posana* (*Ksīra-Dadhi, Kedāri-Kulya, Khale Kapota* etc).
- **Dhātu:** General introduction and definition of *Dhātu*. Formation, Definition (*Nirukti*), Distribution, Attributes, quantity, classification, *Pāñcabhautika* composition and Functions of all seven *Dhātus* in detail: *Rasa, Rakta, Māmsa, Meda, Asthi, Majjā, Śukra*.
- Applied physiology of *Dhātu*: Manifestations of *Ksaya* and *Vriddhi* of each *Dhātu*. Description of *Dhātu Pradosaja Vikāra*. Modern laboratory, Ayurvedic & clinical methods to assess the functional mechanism of *Dhātu*.
- Description of *Āśraya* and *Āśrayī* kind of relationship between *Dosa* and *Dhātu*.

- Description of the characteristic features of Astavidha Sāra. Description of Rasavaha, Raktavaha, Māmsavaha, Medovaha, Asthivaha, Majjāvaha and Śukravaha Srotāmsi.
- **Ojas**: Definition, locations, synonyms, Formation, Distribution, Properties, Quantity, Classification and Functions of Ojas. Description of Vyādhiksamitva. Bala Vrddhikara Bhāva. Classification of Bala. Relation between Ślesmā, Bala and Ojas.
- Applied physiology of Ojas: Etiological factors and manifestations of Ojaksaya, Visramsa and Vyāpat. Physiological and clinical significance of Ojas.
- **Upadhātu**: General introduction and Definition of the term 'Upadhātu'. Formation, Nourishment, Quantity, Properties, Distribution and functions of each Upadhātu.
- **Stanya**: Characteristic features and methods of assessing Śuddha and Dūsita Stanya, Manifestations of Vrddhi and Ksaya of Stanya.
- **Ārtava**: Characteristic features of Śuddha and Dūsita Ārtava. Differences between Raja and Ārtava, physiology of Ārtavavaha Srotāmsi.
- Study of Tvak
- **Physiology of Mala** - Definition of the term 'Mala'. Definition, Formation, Properties, Quantity and Functions of Purīsa, Mutra. Manifestations of Vrddhi and Kshaya of Purīsa and Mūtra.
- **Sveda** - Definition, Formation, Properties, Quantity and Functions of Svedavaha Srotāmsi. Formation of Sveda. Manifestations of Vrddhi and Ksaya of Sveda.
- **Dhātumala** - Definition, Formation, properties, Quantity, Classification and Functions of each Dhātumala.

## Paper-II

100 Marks

### PRAKRTI EVAM SATTVA VIJÑĀNA

- **Deha-Prakrti**: Various definitions and synonyms for the term 'Prakrti'. Factors influencing the Prakrti. Classification of Deha-Prakrti. Characteristic features of the individuals belonging to each kind of Deha-Prakrti. Recent advances in understanding the Prakrti.  
Concepts of somatotypes, psychological traits, classification of personality.
- **Manas Prakrti** : Types of Manas Prakrti with their characteristic features and its Practical implication, Properties of Satwa, Rajas, Tamas and their effect on mind
- **Pancajnanendriya**: Physiological description of Pancajnanendriya and physiology of perception of Śabda, Sparśa, Rūpa, Rasa, Gandha. Indriya-panca-pancaka; Physiological description of Karmendriya.
- **Manas** - Definition, location (sthana), Properties, Functions and Objects of Manas.  
Modern and ayurvedic methods to assess satva (mana)  
Conceptual study and physiological, clinical significance of assessment of sara, samhanana, Pramana, satmya, aharashakti, Vyayamshakti, vaya
- **Ātmā** - Definition, Properties of Ātmā. Difference between Paramātmā and Jīvātmā; Characteristic features of Ātmā.
- **Buddhi** - Location, Types, Functions of Buddhi; Physiology of Dhī, Dhrti and Smrti.
- **Nidrā** - Definition of Nidrā, Classification of Nidrā. Tandra, physiological and clinical significance of Nidra; Svapnotpatti and Svapnabheda.
- Physiology of special senses.
- Physiology of Intelligence, Memory, Learning and Motivation.
- Physiology of sleep.
- Physiology of speech and articulation.
- Physiology of Pain and temperature.

**KOSTHANGAE KRIYA VIJÑĀNA**

Ayurvedic and modern physiological study, Histology and functional importance of different Koshthanga like liver, spleen, Heart etc.

- Āhāra: Definition and significance of Āhāra. Classification of Āhāra. Āhāra-vidhi-vidhāna. Asta āhāra-vidhi viśesāyatana, Āhāraparināmakara bhāva.
- Āhārpāchana: Āhāra Pāka Prakriyā, Description of Annavaha Srotās. Description of Avasthāpāka and Nishthapaka. Role of dosha in Āhārapāka. Sāra and Kitta Vibhajana. Absorption of Sāra. Utpatti and Udieeran of Vāta-Pitta-Kapha.
- Definition of the term Kostha. Physiological classification of Kostha and the characteristics of each kind of Kostha.
- Agni: Description of the importance of Agni. Classification of Agni. Locations, properties and functions of Jātharāgni, Bhūtāgni, and Dhātvaagni.
- Applied physiology of Agni in Kriyā Śārīra and Cikitsā.
- Description of the aetiology and features of Annavaha Srotodusti. Applied physiology of Annavaha Srotās: Arocaka, Ajīrna, Atīsāra, Grahanī, Chardi, Parināma Śūla Agnimāndya.
- Description of the process of digestion of fats, carbohydrates and proteins in human gastrointestinal tract. Different digestive juices, their enzymes and their mechanisms of action. Functions of Salivary glands, Stomach, Pancreas, Small intestine, Liver and large intestine in the process of digestion and absorption.
- Movements of the gut (deglutition, peristalsis, defecation etc.) and their control. Role of neuro-endocrine mechanisms in the process of digestion and absorption. Enteric nervous system.
- Applied physiology of gastrointestinal tract: Vomiting, Diarrhoea, Malabsorption 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.

**MODERN PHYSIOLOGY AND ITS APPLIED ASPECT****General Physiology :**

- Definition and mechanisms of maintenance of Homeostasis. Cell as the living unit of the body. Membrane Physiology. Transportation of various substances across cell membrane. Resting membrane potentials and action potentials. The internal environment. Genetic code, its expression and regulation of gene expression.

**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 characteristics of different hormones. Description of hormones secreted by Hypothalamus, Pituitary gland, Thyroid gland, Parathyroid glands, Pancreas, Adrenal glands and their physiological effects. Effects of hypo and hyper-secretion of various hormones.
- Male and female reproductive physiology. Spermatogenesis and oogenesis. Hormonal regulation of uterine and ovarian cycles. Physiology of pregnancy and lactation. Parturition:
- Adipose tissue and its Function. Circulating lipids. Description of lipoproteins like VLDL, LDL and HDL and their composition.
- 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:**

- Physiology of Cardio-Vascular system: Functional anatomy of cardiovascular system. Cardiac cycle. Heart sounds. Regulation of cardiac output and venous return. Physiological basis of ECG. Heart-rate and its regulation. Arterial pulse. Systemic arterial blood pressure and its control. Regional circulations. Physiology of lymphatic circulation.
- Physiology of Respiratory system: Functional anatomy of respiratory system. Ventilation. Mechanism of respiration. Exchange and transportation of gases. Neural and chemical control of respiration. Spirometry and lung function tests. Artificial respiration.
- Functions of Haemopoietic 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:**

- Physiology of excretion. Functional anatomy of urinary tract. Functions of kidneys. Mechanism of formation of urine. Control of micturition. Renal function tests.
- 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 (Holing Natural urges)

#### **Learners should be well versed with the following instruments-**

- Physiograph, Computerised 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 understanding the Prakrti. Brief description related to some of the recent studies exploring the genetic/biochemical/haematological/electrophysiological basis for prakrti. Introduction to the recent tools to assess prakrti (questionnaires and various Parameter software)
- Recent advances in tissue engineering and stem cell research.

**PRACTICAL****Ayurvedic practicals**

- Assessment of Prakrti
- Assessment of Sāra
- Assessment of Dosa Vrddhi Ksaya Laksana
- Assessment of Dhātu Vrddhi – Ksaya Laksana
- Assessment of Agni
- Assessment of Kostha
- Assessment of Śarīra Bala through Vyāyāma Śakti
- Mūtra Parīksa
- Nādī Parīksā
- Anguli Pramāna
- Assessment of Sātmya
- Assessment of Satva
- Assessment of Samhanana
- Assessment of Vaya
- Assessment of Aayu
- Assessment of Dosha karya
- Assessment of Dhatu karya
- Assessment of Mala karya
- Purisha Pariksha

**Hematology & 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 Tests
- Liver Function Tests
- 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 and bile pigments in urine
- Detecting the presence of pus cell, casts 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 functions
- Examination of Autonomic Nervous System
- EEG recording (Demonstration)

#### **Requirements to be fulfilled before final examination**

- Atleast 10 theory classes for First Prof. BAMS Students
- Participation and presentation of papers in atleast 2 National/International Seminars.
- Publication/acceptance of atleast 1 reserch paper/article in a scholarly journal.
- Departmental Presentation- Atleast 20 per student

#### **Practical**

**100 Marks**

#### **Marks Distrubution**

• Practical Record book	-	05
• Ayurvedic Practical	-	10
• Modern Practical	-	10
• Assesment of Teaching skill	-	10
• Project work	-	10
• Presentation of Thesis	-	15
• Viva Voce	-	<u>30</u>
• Log-Book	-	10
<b>Total Marks</b>		<b>100</b>

#### **Reference Books-**

1. Practical Physiology - C.L. Ghai
2. Textbook of medical Laboratory Technology - P.B. Godkar & D.P. Godkar

## Reference Books

- Ayurvediya Kriyasharir
- Kayachikitsa Parichaya
- Prakrit Agni Vigyan
- Sharir Kriya Vigyan
- Abhinava Sharir Kriya Vigyana
- Dosha Dhatu Mala Vigyana
- Prakrita Dosha Vigyana
- Tridosha Vigyana
- Sharira Tatva Darshana
- Prakrita Agni Vigyana
- Deha Dhatvagni Vigyana
- Sharir Kriya Vigyana (Part 1-2)
- Sharir Kriya Vigyana
- Sharira Kriya Vijnana (Part 1 and 2)
- Dosha Dhatu Mala Vigyana
- Abhinava Sharir Kriya Vigyana
- Pragyogik Kriya Sharir
- Kaya Chikitsa Parichaya
- Concept of Agni
- Purush Vichaya
- Kriya Sharir
- Sharir Kriya Vigyana
- Basic Principles of Kriya-Sharir (A treatise on Ayurvedic Physiology)
- Sharir Kriya – Part I & Part II
- Human Physiology in Ayurveda
- Sharirkriya Vignyan Practical Hand Book
- Sharir Kriya Part 1
- Sharir Kriya Part 2
- Textbook of Physiology
- Review of medical physiology
- Essentials Of Medical Physiology
- Concise Medical Physiology
- Fundamental of Anatomy & Physiology
- Principals of Anatomy & Physiology
- Human Physiology
- Samson Wrights Applied Physiology, Keele, Neil, joels
- Brainstem Control of Wakefulness And Sleep- Steriade, Mirce
- An Introduction to Human Physiology
- Ancient Indian Medicine
- Biographical History of Indian Medicine
- Ayurveda Kriya Sharira
- Textbook of Medical Physiology
- Tridosha Theory
- Statistics in Medicine
- Prayogika Sharir kriya
- Ranjit rai Desai
- C. Dwarikanath
- C. Dwarikanath
- Shiv Charan Dhyani
- Acharya Priyavrata Sharma
- Shankar Gangadhar Vaidya
- Acharya Niranjana Dev
- Shri Upendranath Das
- Hirlekar Shastri
- Niranjana Dev
- Vd. Pt. Haridatt Shastri
- Acharya Purnchandra Jain
- Shri Moreshwar Dutt. Vd.
- Nandini Dhargalkar
- Basant Kumar Shrimal
- Dr. Shiv Kumar Gaur
- Acharya P.C. Jain
- Dr. C. Dwarkanath
- Vd. Bhagwan Das
- Acharya V.J. Thakar
- Prof. Yogesh Chandra Mishra
- Prof. Jayaram Yadav & Dr. Sunil Verma.
- Dr. Srikant Kumar Panda
- Dr. Ranade, Dr. Deshpande & Dr. Chobhe
- Dr Kishor Patwardhan
- Dr.Ranade, Dr.Chobhe, Dr. Deshpande
- Dr.R.R.Deshapande, Dr.Wavhal
- Dr.R.R.Deshapande, Dr.Wavhal
- Gyton & Hall
- William Ganong
- Sembulingam, K.
- Chaudhari, Sujit. K.
- Martini
- Tortora & Grabowski
- Richards, Pocock
- Green, J.h.
- Kutumbiah P.
- Srikanthamurthy KR
- Yogesh Chandra Mishra
- Indu Khurana
- Subrahmanya Shastri
- K. Syamalan
- Prof M.S, Meena & Dr. Mahendra Prasad

## Important journals to refer:

1. Advances in Physiology Education
2. Academic Medicine
3. Indian journal of Physiology and Pharmacology
4. Journal of Ayurveda and Integrative Medicine
5. Evidence-based Complementary and Alternative Medicine
6. AYU
7. All journals of American Physiological Society
8. Journal of Physiology

**Recent Reseach Papers in Kriya Sharir / Physiology to refer**

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