

1.3 KRIYA SHARIR (PHYSIOLOGY)

**Theory-Two Papers-200 Marks (100 marks each)
Teaching hours-180 hours**

PAPER- I

100 marks

PART- A

50 marks

1. Conceptual study of fundamental principles of Ayurvediya Kriya Sharir e.g - Panchamahabhuta, Tridosha, Triguna, Loka-Purusha Samya, Samanya-Vishesha. Description of basics of Srotas.
2. Definition and synonyms of the term Sharir, definition and synonyms of term Kriya, description of Sharir Dosha and Manasa Dosha. Mutual relationship between Triguna-Tridosha & Panchmahabhuta. Difference between Shaarir and Sharir. Description of the components of Purusha and classification of Purusha, role of Shatdhatupurusha in Kriya Sharira and Chikitsa.
3. Dosha- General description of Tridosha. Inter relationship between Ritu-Dosha-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 and in maintaining of health. Prakrita and Vaikrita Dosha.
4. Vata Dosha: Vyutpatti (derivation), Nirukti (etymology) of the term Vata, general locations, general properties and general functions of Vata, five types of Vata (Prana, Udana, Samana, Vyana, Apana) with their specific locations, specific properties, and specific functions.
Respiratory Physiology in Ayurveda, Physiology of speech in Ayurveda.
5. Pitta Dosha: Vyutpatti, Nirukti of the term Pitta, general locations, general properties and general functions of Pitta, five types of Pitta (Pachaka, Ranjaka, Alochaka, Bhrajaka, Sadhaka) with their specific locations, specific properties, and specific functions. Similarities and differences between Agni and Pitta.
6. Kapha Dosha: Vyutpatti, Nirukti of the term Kapha, general locations, general properties and general functions of Kapha, five types of Kapha (Bodhaka, Avalambaka, Kledaka, Tarpaka, Śleshaka) with their specific locations, specific properties, and specific functions.
7. Etiological factors responsible for Dosha Vriddhi, Dosha Kshaya and their manifestations.
8. Concept of Kriyakala.
9. Prakriti:
 - a) Deha- Prakriti: Vyutpatti, Nirukti, various definitions and synonyms for the term 'Prakriti'. Intra-uterine and extra-uterine factors influencing Deha-Prakriti, classification and characteristic features of each kind of Deha-Prakriti.

- b) Manasa- Prakriti: Introduction and types of Manasa- Prakriti.
10. Ahara: Definition, classification and significance of Ahara, Ahara-vidhi-vidhana, Ashta Aharavidhi Viseshayatana, Ahara Parinamkar Bhava.
 11. Aharapaka (Process of digestion): Description of Annavaha Srotas and their Mula. Role of Grahani & Pittadhara Kala.
 12. Description of Avasthapaka (Madhura, Amla and Katu). Description of Nishthapaka (Vipaka) and its classification. Separation of Sara and Kitta. Absorption of Sara. Genesis of Vata-Pitta-Kapha during Aharapaka process. Definition of the term Koshtha. Classification of Koshtha and the characteristics of each type of Koshtha.
 13. Agni – Definition and importance, synonyms, classification, location, properties and functions of Agni and functions of Jatharagni, Bhutagni, and Dhatvagni.

PART- B

50 marks

Modern Physiology

- a) Definition and mechanisms of maintenance of homeostasis. Cell physiology. Membrane physiology. Transportation of various substances across cell membrane.
- b) Resting membrane potential and action potential.
- c) Physiology of respiratory system: functional anatomy of respiratory system. Definition of ventilation, mechanism of respiration, exchange and transport of gases, neural and chemical control of respiration, artificial respiration, asphyxia, hypoxia. Introduction to Pulmonary Function Tests.
- d) Physiology of Nervous System: General introduction to nervous system, neurons, mechanism of propagation of nerve impulse, physiology of CNS, PNS, ANS; physiology of sensory and motor nervous system, Functions of different parts of brain and physiology of special senses, intelligence, memory, learning and motivation. Physiology of sleep and dreams, EEG. Physiology of speech and articulation. Physiology of temperature regulation.
- e) Functional anatomy of gastro-intestinal tract, mechanism of secretion and composition of different digestive juices. Functions of salivary glands, stomach, liver, pancreas, small intestine and large intestine in the process of digestion and absorption. Movements of the gut (deglutition, peristalsis, defecation) and their control. Enteric nervous system.
- f) Acid-base balance, water and electrolyte balance. Study of basic components of food. Digestion and metabolism of proteins, fats and carbohydrates. Vitamins & Minerals- sources, daily requirement, functions, manifestations of hypo and hypervitaminosis.

PAPER- II

100 marks

PART- A

50 marks

1. Dhatu:

Etymology, derivation, definition, general introduction of term Dhatu, different theories related to Dhatuposhana (Dhatuposhana Nyaya)

2. Rasa Dhatu:

Etymology, derivation, location, properties, functions and Praman of Rasa-dhatu. Physiology of Rasavaha Srotas, Formation of Rasa Dhatu from Aahara Rasa, circulation of Rasa (Rasa-Samvahana), role of Vyana Vayu and Samana Vayu in Rasa Samvahana. Description of functioning of Hridaya. Ashtavidha Sara (8 types of Sara), characteristics of Tvakasara Purusha, conceptual study of mutual interdependence (Aashraya-Aashrayi Bhaava) and its relation to Rasa and Kapha. Manifestations of Kshaya and Vriddhi of Rasa.

3. Rakta Dhatu:

Etymology, derivation, synonyms, location, properties, functions and Praman of Rakta Dhatu. Panchabhautikatva of Rakta Dhatu, physiology of Raktavaha Srotas, formation of Raktadhatu, Ranjana of Rasa by Ranjaka Pitta, features of Shuddha Rakta, specific functions of Rakta, characteristics of Raktasara Purusha, manifestations of Kshaya and Vriddhi of Raktadhatu, mutual interdependence of Rakta and Pitta.

4. Mamsa Dhatu :

Etymology, derivation, synonyms, location, properties and functions of Mamsa Dhatu, physiology of Mamsavaha Srotasa, formation of Mamsa Dhatu, characteristics of Mamsasara Purusha, manifestations of Kshaya and Vriddhi of Mamsa Dhatu .Concept of Peshi.

5. Meda Dhatu :

Etymology, derivation, location, properties, functions and Praman of Meda Dhatu, physiology of Medovaha Srotas, formation of Medo Dhatu, characteristics of Medasara Purusha and manifestations of Kshaya and Vriddhi of Meda.

6. Asthi Dhatu:

Etymology, derivation, synonyms, location, properties, functions of Asthi Dhatu. Number of Asthi. Physiology of Asthivaha Srotas and formation of Asthi Dhatu, characteristics of Asthisara Purusha, mutual interdependence of Vata and Asthi Dhatu, manifestations of Kshaya and Vriddhi of Asthi Dhatu.

7. Majja Dhatu :

Etymology, derivation, types, location, properties, functions and Praman of Majjaa Dhatu, physiology of Majjavaha Srotas, formation of Majja Dhatu, characteristics of Majja Sara Purusha, relation of Kapha, Pitta, Rakta and Majja, manifestations of Kshaya and Vriddhi of Majja Dhatu.

8. Shukra Dhatu:

Etymology, derivation, location, properties, functions and Praman of Shukra Dhatu, physiology of Shukraravaha Srotas and formation of Shukra Dhatu. Features of Shuddha Shukra, characteristics of Shukra-Sara Purusha, manifestations of Kshaya and Vriddhi of Shukra Dhatu.

9. Concept of Ashraya-Ashrayi bhava i.e. inter-relationship among Dosha, Dhatu Mala and Srotas.

10. Ojas: Etymological derivation, definition, formation, location, properties, Praman, classification and functions of Ojas. Description of Vyadhikshamatva.

Bala Vriddhikara Bhava. Classification of Bala. Etiological factors and manifestations of Ojavisramsas, Vyapat and Kshaya.

- 11. Upadhatu:** General introduction, etymological derivation and definition of the term Upadhatu. Formation, nourishment, properties, location and functions of each Upadhatu.
- Stanya: Characteristic features and methods of assessing Shuddha and Dushita Stanya, manifestations of Vriddhi and Kshaya of Stanya.
 - Artava: Characteristic features of Shuddha and Dushita Artava. Differences between Raja and Artava, physiology of Artavavaha Srotas.
 - Tvak: classification, thickness of each layer and functions.
- 12. Mala:** Etymological derivation and definition of the term Mala. Aharamala: Enumeration and description of the process of formation of Aharamala.
- Purisha: Etymological derivation, definition, formation, properties, quantity and functions of Purisha. Physiology of Purishavaha Srotas, manifestations of Vriddhi and Kshaya of Purisha.
 - Mutra: Etymological derivation, definition, formation, properties, quantity and functions of Mutra. Physiology of Mutravaha Srotas, physiology of urine formation in Ayurveda, manifestations of Vriddhi and Kshaya of Mutra.
 - Sveda: Etymological derivation, definition, formation and functions of Sveda. Manifestations of Vriddhi and Kshaya of Sveda. Description of Svedvaha Srotas
 - Dhatumala: Brief description of each type of Dhatumala.
- 13. Panchagyanendriya:** Physiological description of Panchagyaanendriya and physiology of perception of Shabda, Sparsha, Rupa, Rasa and Gandha. Physiological description of Karmendriya.
- 14. Manas:** Etymological derivation, definition, synonyms, location, properties, functions and objects of Manas. Physiology of Manovaha Srotas.
- 15. Atma:** Etymological derivation, definition, properties of Atma. Difference between Paramatma and Jivatma; Characteristic features of existence of Atma in living body.
- 16. Nidra:** Nidrotpatti, types of Nidra, physiological and clinical significance of Nidra; Svapnotpatti and types of Svapna.

PART –B

50 marks

Modern Physiology

- Haemopoetic system – composition, functions of blood and blood cells, Haemopoiesis (stages and development of RBCs, and WBCs and platelets), composition and functions of bone marrow, structure, types and functions of haemoglobin, mechanism of blood clotting, anticoagulants, physiological basis of blood groups, plasma proteins, introduction to anaemia and jaundice.
- Immunity, classification of immunity: Innate, acquired and artificial. Different mechanisms involved in immunity: Humoral (B-cell mediated) and T-Cell mediated immunity. Hypersensitivity.

3. Muscle physiology – comparison of physiology of skeletal muscles, cardiac muscles and smooth muscles. Physiology of muscle contraction.
4. 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.
5. Adipose tissue, lipoproteins like VLDL, LDL and HDL triglycerides.
6. Functions of skin, sweat glands and sebaceous glands.
7. Physiology of male and female reproductive systems. Description of ovulation, spermatogenesis, oogenesis, menstrual cycle.
8. Physiology of Excretion – functional anatomy of urinary tract, functions of kidney. Mechanism of formation of urine, control of micturition. Formation of faeces and mechanism of defecation.
9. Endocrine glands – General introduction to endocrine system, classification and characteristics of hormones, physiology of all endocrine glands, their functions and their effects.

PRACTICAL

100 marks

Teaching hours-180

Ayurvedic practical

1. Assessment of Prakriti
2. Assessment of Dosha (Features of Vriddhi- Kshaya)
3. Assessment of Dhatu (Features of Vriddhi- Kshaya)
4. Assessment of Agni
5. Assessment of Koshtha
6. Assessment of Sara
7. Nadi pariksha

Modern physiology practical

1. Introduction to laboratory instruments- Simple & Compound Microscope, Scalp vein set, bulbs for blood collection, Sahli's Haemometer, Haemocytometer, pipettes, Urinometer, Albuminometer, Stethoscope, B.P. Apparatus, Harpenden's caliper, Clinical Hammer, Tuning Fork, Stop Watch, Thermometer, Centrifuge machine, ECG Machine
2. Collection of blood sample – prick, vene-puncture method, use of anticoagulants
3. Preparation of blood smear and staining
4. Estimation of Hemoglobin
5. Microscopic examination of blood
 - a. Total RBC count
 - b. Total WBC count
 - c. Differential leucocyte count
6. Packed cell volume (PCV) demonstration
7. ESR demonstration
8. Bleeding time, Clotting time
9. Blood grouping and Rh typing
10. Examination of Cardio-Vascular system
 - a. Pulse examination
 - b. Arterial blood pressure measurement
 - c. Examination of heart sounds
 - d. ECG demonstration

11. Examination of Respiratory system
 - a. Respiratory rate
 - b. Breath sounds
 - c. Spirometry
12. Examination of Nervous System- Sensory & Motor.
13. Urine examination –Physical examination, chemical examination. Test for normal constituents of urine. Detection of specific gravity and reaction of urine.

Distribution of Practical marks

1. Laboratory Practical	- 20
2. Human Experiment	- 15
3. Spotting	- 15
4. Prakriti Saradi pariksha	- 20
5. Practical Record	- 10
6. Viva- voce	- 20

REFERENCE BOOKS:-

- Ayurvediya Kriyasharir - Ranjit Rai Desai
- Kayachikitsa Parichaya - C. Dwarkanath
- Prakrit Agni Vigyan - C. Dwarkanath
- Sharir Kriya Vigyan - Shiv Charan Dhyani
- Abhinava Sharir Kriya Vigyana - Acharya Priyavrata Sharma
- Dosha Dhatu Mala Vigyana - Shankar Gangadhar Vaidya
- Prakrita Dosha Vigyana - Acharya Niranjana Dev
- Tridosha Vigyana - Shri Upendranath Das
- Sharira Tatva Darshana - Hirlekar Shastri
- Prakrita Agni Vigyana - Niranjana Dev
- Deha Dhatvagni Vigyana - Vd. Pt. Haridatt Shastri
- Sharir Kriya Vigyana (Part 1-2) - Acharya Purnchandra Jain
- Sharir Kriya Vigyana - Shri Moreshwar Dutt. Vd.
- Sharira 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 Sharir - Acharya P.C. Jain
- Kaya Chikitsa Parichaya - Dr. C. Dwarkanath
- Concept of Agni - Vd. Bhagwan Das
- Purush Vichaya - Acharya V.J. Thakar
- Kriya Sharir - Prof. Yogesh Chandra Mishra
- Sharir Kriya Vigyana - Prof. Jayaram Yadav & Dr. Sunil Verma.
- Basic Principles of Kriya-Sharir (A treatise on Ayurvedic Physiology) by Dr. Srikant Kumar Panda
- Sharir Kriya – Part I & Part 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 1 – Dr.R.R.Deshapande, Dr.Wavhal
- Sharir Kriya Part 2 – Dr. R.R.Deshapande, Dr.Wavhal
- Ayurveda Kriya Sharira- Yogesh Chandra Mishra
- Textbook of Physiology - Gyton & Hall
- A Textbook of Human Physiology – A.K.Jain
- Essentials of Medical Physiology - Sembulingam, K.