

2.3. Rasashastra Evam Bhaishajyakalpana

(IATROCHEMISTRY AND AYURVEDIC PHARMACEUTICS)

Theory -Two Papers

Total Marks- 200

Teaching hours-200

Practical :-

Total Marks-200

Teaching hours-200

RASASHASTRA

Paper 1

100 Marks

Part A

50 Marks

1. Definition and etymology of Rasa, History of Rasashastra, Importance of Rasaushadhi, Concept of Rasa-Rasayana, Concept of Raseshwar Darshana. Concept of Rasashala and Rasamandap.
2. Brief Description and Application of Technical terminologies (Paribhasha): Avapa, Nirvapa, Dhalana, Bhavana, Jarana, Murchana, Shodhana, Marana, Amrutikarana, Lohitikarana, Mruta Loha, Satwa Patana, Druti, Apunarbhava, Niruttha, Rekhapurna, Varitara.
3. Dravya Varga: Amlavarga, Panchamrittika, Panchagavya, Panchamrita, Ksharashtaka, Dravakagana, Mitra panchaka, Rakta varga, Lavanapanchaka.
4. Brief description of Yantras and their application Ulukhala Yantra, Khalwa Yantra, Kachhapa Yantra, Damaru Yantra - Vidhyadhara Yantra- Urdhwapatan, Addhapatan & Tiryakpatana Yantra, Jaranartha Tulayantra, Dolayantra, Patalayantra, Palika Yantra, Baluka Yantra, Bhudhara Yantra, Sthali Yantra, Swedana Yantra.
5. Brief description & application of Musha (Crucible): Samanya Musha, Gostani musha, Vajra Musha, Maha musha, Yoga musha, Vrintaka Musha, Malla / Pakwa musha. Different types of crucibles e.g. Silica crucible, platinum crucible. Mudra and Sandhi Bandhana.
6. Brief description & applications of Chullika, Satwapatana Koshti, Patala Koshti, Gara Koshti, Angarakoshti and knowledge of various heating appliances viz. Gas stove, Hot plate, Heating mantle, Induction Stove, Hot Air Oven.
7. Concept, definition and types of Puta: Suryaputa, Chandraputa, Gomayaputa, Lawakaputa, Kukkutaputa, Kapotaputa, Varahaputa, Gajaputa, Mahaputa, Kumbhaputa, Valukaputa, Bhudharaputa, Applications of Electric muffle furnace and fuel (diesel) dependent furnace. Brief introduction to thermocouple and pyrometer.

8. Knowledge of Parada: Synonyms, Occurrence, natural and artificial sources of Parada, Hingulottha parada, Types of Parada, Parada Dosha: Naisargika, Yougika, Aupadhika (Kanchuka). Grahya-Agrahya Parada, Parada gati, Parada bandha, Shodhana of Parada. Parada sanskara and brief description of Ashtasamskara.
9. Concept of Murchhana and Jarana of Parada, Preparation of Kajjali, Classification of Rasaushadhi: Khalvi rasa e.g. Tribhuvana Keerti Rasa, Parpati Rasa- Rasa Parpati, Kupipakva Rasa- Rasa sindur, Pottali rasa - Hemagarbha pottali. Rasa sevana vidhi and pathya and apathya.
10. Brief introduction of quality control , standardization and GMP of Rasaoushadhies.

Part B

50 Marks

Occurrence, Synonyms, Minerological identification, Sources, Types, Grahya and Agrahyata, Shodhana, Marana and other processing techniques. Properties, dose, anupan and therapeutic uses, pathya – apathya and ashuddha, apakwa and avidhee sevanjanya dosha and its management, important formulations of the following:

1. **Maharasa** –Abhraka (Biotite Mica), Vaikrantha, Makshika (Chalco-pyrite), Vimala (Iron Pyrite), Shilajatu, Sasyaka (Peacock ore), Chapala and Rasaka (Sphalerite).
2. **Uparasa** – Gandhaka (Sulfur), Gairika (Red Ochre), Kasisa (Green Vitriol), Kankshi (Alum), Haratala (Orpiment), Manahshila (Realgar), Anjana and Kankustha.
3. **Sadharana Rasa** – Kampillaka, Gauri pashana (Arsenic oxide), Navasadara (Ammonium chloride), Kaparda (Cowry), Agnijara, Giri Sindura (Red oxide of Hg), Hingula (Red Cinnabar) and Mriddara shringa (Litharge).
4. **Dhatu** -Swarna (Gold), Rajata (Silver), Tamra (Copper), Loha (Iron), Vanga (Tin), Naga (Lead), Yashada (Zinc), Kamsya (Bronze), Pittala (Brass), Vartaloha. Dhatu -graha sambandha.
5. **Ratna** - Manikya (Ruby), Mukta (Pearl), Pravala (Coral), Tarkshya (Emerald), Pushparaga (Topaz), Vajra (Diamond), Nilam (Sapphire), Gomeda (Zircon or Cinnamone stone), Vaidurya (Cats eye). Ratnapariksha, Ratnadosha, Ratna-graha sambandha.
6. **Uparatna**- Vaikranta (Tourmaline), Suryakanta (Sun stone), Chandrakanta (Moon stone), Rajavarta (Lapis lazuli), Perojaka (Turquoise), Sphatikamani (Quartz), Trinakanta, Palanka, Putika, Rudhir.
7. **Sudha varga** – Sudha (Lime stone), Kaparda (Cowries), Shukti (Oyster Shell) , Shankh (Conch Shell), Mriga shringa (Stag horn), Khatika, Godanti (Gypsum) and Samudraphena (Cattle Fish bone), Kukkutanda twak (Hen's Egg Shell).

- 8. Sikata varga** - Sikata (Silica), Dugdhapashana (Talc), Nagapashana / Jaharmohara (Serpentine), Badarshama (silicate of lime), Vyomashma (Sangeyashab - Jade), Kousheyashma (Asbestos) and Akika (Agate).
- 9. Kshara varga** - Sarja kshara (Sodium bicarbonate), Yava kshara, Tankana kshara (Borax), Surya Kshara (Potassium Nitrate).
- 10. Miscellaneous** - Mandura, Bola, Dam-ul Akhawayan (Raktabandhini), Kasturi, Bhoonag, Mayurpiccha, Sarjarasa, Madhoochishta.
- 11. Visha and Upavisha**-Introduction, collection and storage, classification, synonyms, shodhana, antidote, therapeutic and toxic doses, anupan, therapeutic uses, and formulations of following Visha and Upavisha-Vatsanabha, Kuchala, Jayapala, Dhattura, Bhanga, Bhallataka, Gunja, Arka, Snuhi. Langali, Karaveera, Ahiphena and Chitrakmool.
- 12. Aushadhi Yoga Gyanam- ingredients, manufacturing process, and bhesajprayogvidhi.** Arogya Vardhini Gutika, Kasturibhairava Rasa, Kumara Kalyana Rasa, Garbhapala Rasa, Chandraprabha Vati, Chandramrita Rasa, Pratapalankeshwara Rasa, Pravalapanchamrita Rasa, Anandbhairava Rasa, Yogendra Rasa, Laxmivilas Rasa, Vasantakusumakara, Vasantamalati Rasa, Brihat Vata Chintamani Rasa, Shankha vati, Shwaskuthara Rasa, Hinguleswara Rasa, Hemagarbhapottali, Hridyarnava Rasa, Swarnavanga, Makaradhwaja, Putapakwavaisham Jwarantaka Loha, Vatvidhvamsan Rasa, Kamadugha Rasa, Laghusutshekhar Rasa, Navayasa Loha, Saptamrita Loha, Tamra Parpati, Panchamrita Parpati, Sveta Parpati.
- 13. Introduction to** pharamcovigilance and its status in India, with reference to Ayurvedic drugs.
 A) Necessary to know – From part A and B : S. No. 1 to 9
 B) Desired to know – From part B : S. No. 10

Practical

100 Marks

Minimum Twenty five practicals to be performed

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|-------------------------|--|
| 1. Rasa [Parada] | Samanya Shodhana of Parada
Kajjali
Mugdha rasa |
| 2 Maharasa varga | Shodhana of Abhraka
Dhanyabhraka nirmana
Shodhana of Makshika
Shodhana of Shilajatu
Shodhana of Sasyaka. |
| 3. Uparasa varga | Shodhana of Gandhaka
Shodhana of Gairika |

4. Sadharana rasa varga

Shodhana of Kasisa
Shodhana of Kankshi
Shodhana of Haratala
Rasa manikya nirman
Shodhana of Manashila
Shodhana of Hingula
Shodhana of Navasadar

5. Sudha Varga

Shodhana of Kapardika
Shodhana of Shankha
Shodhana of Shukti
Shodhana of Pravala mula

6. Dhatu varga

Shodhana of Godanti
Samanya Shodhana of Lauha
Shodhana of Mandura
Samanya Shodhana of Tamra

7. Kshara Varga

8. Parpati

Shodhana of Naga
Shodhana of Vanga
Shodhana of Yashada
Shodhana of Tankana
Preparation of Rasaparpati, Bola
Parpati and Swetaparpati

9. Visha varga

Shodhana of Vatsanabha,
Bhallataka, Kupilu, Dhattura beeja,
Jayapala, Gunja, Chitrakamoola.

PRACTICAL FOR DEMONSTRATION / GROUP PRACTICALS

1. Hingulad rasakrishti (Hingulottha Parada).
2. Bhasma: 4 (One from each group)
 - i. Abhraka bhasma, Swarna Makshika bhasma, Tamra bhasma
 - ii. Vanga bhasma, Naga bhasma, Yashada bhasma
 - iii. Mandura bhasma, Kasisa bhasma
 - iv. Shankha bhasma, Kapardika bhasma, Godanti bhasma.
3. Pishti : 1 Pravala pishti, Jaharmohara / Akika pishti,
Trina kantha mani pishti, Mukta pishti.
4. Druti : 1 Gandhaka druti.
5. Formulations 4 (one from each group)
 - i. Rasasindura, Swarna vanga, Sameer pannaga rasa
 - ii. Saptamruta lauha, Punarnava mandura, Navayasa lauha
 - iii. Agnitundi vati, Tribhuvana kirti rasa, Sootshekhara rasa,
Laghusutashekhara Rasa
 - iv. Arogyavardhini vati, Laghumalinivasanta rasa, Hinguleshwar rasa,
Anandbhairav rasa, Rajapravartini vati

BHAISHAJYAKALPANA

Paper II

100 Marks

Part A

50 Marks

- 1. History and Chronological (kramika vikasa) development** of Bhaishajyakalpana. Concept of Aushadha and Bheshaja.
- 2. Fundamental principles of Bhaishajya Kalpana.**
- 3. Study of Ancient and Contemporary systems of 'Maana' (Units of measurement), Shushka -ardra -drava- dravya grahan niyam (Rules of measures of dry, fresh, liquid drugs);** Grahyagrahyatva, Nava Puran dravya grahan niyam.
- 4. Guidelines and Methods of collection, storage, preservation of Aushadhi dravya.** Concept of Saviryatavadhi (shelf life) and stability in ancient and contemporary science.
- 5. Bheshajprayogavidhi : Aushadha Matra, Anupana and sahanan and Aushadh sevana kaala. (Posology).**
- 6. Panchavidha kashaya kalpana and Other kalpana :** Kashaya Yoni, Swarasa, Kalka, Kwatha, Hima and Phanta, Pramathya, Aushadha siddha paniya, Tandulodaka, Laksha rasa, Mantha, Panaka, Arka, Churna, Rasakriya, Ghana, Phanita, Avaleha, Prasha, Gudapaka, Sharkara, Syrups, Ksheerapaka, Satva, Guggulu kalpana, Vati, Gutti, Pinda, Modaka, Varti Preparation of Tablets, pills, capsule and Suppositories. Masi kalpana, Lavana kalpana, Kshara kalpana and Kshara sutra.
- 7. Introduction and general knowledge of useful instruments/ Equipments -** Disintegrator, Mixer, Grinder, End Runner, Edge Runner, Sieve-Shaker, Granulator, Tableting machine, Pill making machines, coating and polishing pan, capsule filling machine, sieves and mesh.
- 8. Sneha kalpana :** Sneha yoni, Types of Sneha, Sneha murchana vidhi, Sneha paka vidhi, patra paka, types and their use. Sneha siddhi lakshana, dose, Preparation and uses of Triphala Ghrita, Bramhighrita, Narayana taila, Anutaila.
- 9. Sandhana Kalpana and its types:** Madya Kalpana, Asava, Arishta, Sura (Prasanna - Kadambari - Medaka - Jagala - Bakkasa), Maireya, Surasava, Shukta, Kanjika, Sauvairaka, Tushodaka, Sidhu kalpana their methods of preparation, siddhi lakshana, properties, uses, doses. Takrarishta, Draksharishta, Ashokarishta, Dashamoolarishta, Kumaryasava, Chandanasava.

- 10. Kritanna and Aushadhisiddha anna Kalpana:** Definition of Kritanna, Concept of Pathya and Apathya, Yavagu –types of yavagu, Manda, Peya, Vilepi, Anna, Bhakta, Odan, Yush -types, Krishara, Mansa rasa, Vesavara, Khad Kamblika, Raga, Shadava, Dadhi and Takra Varga – Takra, Udasvita, Katvar, Mathita, Chhachika.

PART B

- 1. Bahyopacharartha kalpana (External Applications)-Lepa** -Types of Lepa, methods of preparation and mode of application. Udvardan and Avachurnan, Method of preparation of Siktha Taila, Malahara – Sarjarasa Malahara, Gandhak Malahara, Upanaha, Atasi upanaha, Shatadhouta and Sahastradhouta Ghrita. Brief introduction of semi solid dosage forms- Ointments, Creams, Emulsions, Gels, Lotions.
- 2. Principles and precautions for preparation of formulations for following :**
- 2.1 Netrapacharartha kalpana (Ophthalmic preparations)** – Seka, Drava, Pindi, Anjana - Ashchyotana - Tarpana - Putapaka and Vidalaka, Methods of preparation of eye drops, eye ointments.
- 2.2 Nasyopachararth Kalpana** - Classification of Nasya, Navana, Avapidana, Pradhaman, Marsha and Pratimarsha nasya.
- 2.3 Dhumapanarth kalpana** - Classification of dhumpaana, Method of preparation of dhumvarti and it's therapeutic uses. Dhupan: Vranadhupan, arshodhupan.
- 2.4 Mukhaprayogarth kalpana** - Gandoosha - Kavala - Pratisaran, Tooth paste, Tooth powders and Mouth wash.
- 2.5 Basti kalpana-** Classification, Method of preparation of Niruha and Anuvasana, Basti Therapeutic properties and uses of Basti.
- 3** Brief knowledge of Standardization of Ayurvedic formulations- Kastaushadhi.
- 4** Brief introduction of Drug and Cosmetics Act 1940 and Rules 1945.
- 5** Concept of, Aushadhi Nirmanshala, with respect to Good Manufacturing Practices (GMP) in accordance to Schedule T.

Practical Bhaishajya Kalpana

50 Marks

Following practicals to be performed- (Minimum one from each category)

Method of preparation, therapeutic uses, dose and anupana of the following

- 1.** Swarasa- Ardraka swarasa, Tulasi swarasa, Kumari Swarasa, Vasa putapaka swarasa
- 2.** Kalka- Nimba kalka, Rasona kalka.
- 3.** Kwatha- Punarnavasthaka kwatha, Rasna Sapthaka kwatha, Kulattha kwath.
- 4.** Hima- Dhanyaka hima, Sarivadi hima .
- 5.** Phanta- Panchakola phanta, Yastimadhu Phanta.

6. Pramathya- Mustadi pramathya
7. Mantha- Kharjuradi mantha
8. Aushadh siddha paniya- Shadanga paniya
9. Laksha Rasa.
10. Arka - Yavani arka, Gulab arka, Misreya arka
11. Panaka- Chinchā panaka, Chandan panaka.
12. Sharkara- Banapsha sharkara, Nimbu sarkara.
13. Churna- Sitopaladi Churna, Hinguwashtaka Churna.
14. Gutika- Chitrakadi Gutika, Sanjivani Vati.
15. Guggulu-Triphala Guggulu, Kaishora Guggulu.
16. Avaleha- Chyavanaprashavaleha, Vasavaleha, Vyaghri Haritaki avaleha, Manibadra avaleha.
17. Rasa kriya - Darvi Rasakriya, Guduchi Ghana, Kutaja Ghana.
18. Khanda- Haridra khanda, Narikela khanda, Sowbhagya shunti paka
19. Satva- Amruta satva,
20. Varti- Phala varti, Chandrodaya varthi
21. Lavana- Arka lavana, Narikela lavana
22. Masi- Triphala masi, Mayurpiccha Masi
23. Ksheerapaka- Arjuna ksheerapaka, Rasona ksheerapaka, Shunthi Ksheerapaka
24. Kshara- Apamarga kshara, Snuhi kshara, Ksharasutra. .
25. Manda, Peya, Vilepi, Yavagu, Krishra, Vesavara
26. Yusha - Mudga yusha, Saptamushtika yusha, Kulattha yusha
27. Aristha- Kutajarishta, Takrarishta .
28. Asava - Kumaryasava, Kanakasava
29. Sukta kalpana- Kanji
30. Udaka- Tandulodaka
31. Upanaha- Atasi Upanaha
32. Siktha Taila Nirmaan
33. Malahara- Sarjarasa malahara, Gandaka malahara, Cream, Emulsion. Sneha Kalpana
Sneha Murchhana - Ghrita Murchhana, Taila Moorchhana, Ghrita kalpana: Jatyadi ghrita, Triphala ghrita, ksheerashatphala ghrita- Taila kalpana-Panchaguna taila, Arka taila, Bala taila, Jatyadi taila
35. Taila patana- Bhallataka taila patana, Jayapala taila patana
36. Shodhana- Guggulu, Hingu.

II. Visit of minimum three GMP approved Ayurvedic manufacturing units.

Distribution of Practical Marks: Total 200 Marks

Rasashastra - 100

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| 1. Record Book | - | 10 Marks |
| 2. Experiment | - | 30 Marks |
| 3. Spotting | - | 20 Marks |
| 4. Viva-voce | - | 40 Marks |

Bhaishajyakalpana - 100

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|----------------|---|----------|
| 1. Record Book | - | 10 Marks |
| 2. Experiment | - | 30 Marks |
| 3. Spotting | - | 20 Marks |
| 4. Viva-voce | - | 40 Marks |

Reference Books

- | | |
|---|------------------------------|
| 1. Adyatan Rasa Shastra | R.K. Goyal |
| 2. Abhinav Rasa Shastra | Vaidya Somadev Sharma |
| 3. Asava Arishta Vigyanam | Dr. Pakshdhar Jha |
| 4. Ayurvediya Rasa Shastra (Sachitra) | Chandrabhusan Jha |
| 5. Ayurvediya Rasa Shastra | Badrinarayan Pandey |
| 6. Rasa Bhaishajya Paribhasa | Sureshananda Thapaliyal |
| 7. Ayurvediya Rasa Shastra | Prof. Siddhi Nandan Mishra |
| 8. Ayurved Prakash | Vaidya Gujrat Mishra |
| 9. Drugs and Cosmetic Act - 1940 | |
| 10. Paka Darpana | Dr. Indradev Tripathi |
| 11. The Paka-darpana of King Nala | Dr. Madhulika critical study |
| 12. Parada Vigyaniam | Vasudev M. Dwivedi |
| 13. Pratyaksha Aushadh Nirmanam | Acharya VishwanathDwivdei |
| 14. Bhaishjyakalpana Vigyanam | Dr. Agnihotri |
| 15. Rasa Tarangini | Sadanand Sharma |
| 16. Rasa Darpan | Prof. Bhajan Das Swami |
| 17. Rasa Bindu | Dr. Sanjay Sharma |
| 20. Rasa Bhaishajya Kalpana Vigyan Vaidya | Santosh Kumar Khandal |
| 21. Rasa Mitra | Dr. Tryambak Nath Sharma |
| 22. Rasa Ratna Samuchchaya (Hindi) | Dattattreya Ananta Kulkarni. |
| 23. Rasaratna samuchchaya- | Ambikadatta shastri |
| 24. Rasaratna samuchchaya - | Damodar Joshi |

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| 25. Rasa Shastra Prayogiki Srivastava, | Yadav and Prof. Ramesh Saxena |
| 26. Rasamritam | Vaidya Yadavji Tirkramji Acharya |
| 25. Rasayan Sara | Vaidya Shyam Sunderacharya |
| | Vaishya |
| 26. Rasendra Sampradaya | Vaidya Hajari Lal Sukul |
| 27. Rasendra Sara Sangraha | Vaidya Gopal Krishna |
| 29. Vaidyak Paribhasha Pradeep (Hindi Translation) | Dr. Indradev Tripathi |
| 30. Sharangadhara Samhita | Dr. Radhakrishna Parashar |
| 31. Bharatiya Bhaishajya Kalpana Vigyana | Gananath Vishwanath Dwivedi |
| 32. Bhaishajya Kalpana Vijnanam | Dr. K Ramachandra Reddy |
| 33. Rasa Shastra (English) | Prof. Damodar Joshi |
| 34. Rasa Ratna Samuchchaya (English) | Prof. Damodar Joshi |
| 35. Rasendra Chintamani (Hindi) | Prof. Siddhinandan Mishra |
| 36. Ayurvedic formulary of India | |
| 38. Ayurvedic Pharmacopoeia of India , CCRAS | |
| 39. Bhaishjya Kalpana Vigyan | Siddhi Nandan Mishra |
| 40. Textbook of Rasashasra | Dr. K Ramachandra Reddy. |
| 41. Ashadhayoga Vigyanam | Dr. K. Ramachandra reddy |
| 42. Vaidyaka Paribhasha Pradipa (English Translation) | Dr. K. Ramachndra Reddy & |
| | Dr. P. Suresh |
| 43. Relevant parts of Brihatrayee | |
| 44. Text book of Bhaishjya Kalpana - | Dr Shobha G Hiremath |
| 45. Text Book of Rasa Shastra | Dr P H C Murthy |
| 46. Rasa Chandashu | Prof S S Savirkar (CCRAS Publication) |
| 47 .Bhaishjya Ratnawali | Prof S N Mishra |
| 48 Yoga Ratnakar | |

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