UNIVERSITY GRANTS COMMISSION
NET BUREAU

Subject: Indian Knowledge System **Code No.: 103**

SYLLABUS

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Unit 1: Indian Philosophical Systems - part (a)

Caturdaśa vidyāsthāna-s: 14 branches of learning in ancient India- purāṇa, nyāya, mīmāṁsā, dharmaśāstra, six vedānga-s: (śikṣā, vyākaraṇa, nirukta,chanda, jyotiṣa, kalpa) and four Veda-s- ṛgveda, yajurveda, sāmaveda and atharvaveda; introductory information on them.

Upaveda-s; introductory information on them.

śāstra-s and some introductory information on them.

18 purāṇāsa-s, their names and five general characteristics of purāṇa-s - sarga, pratisarga, vaṃśa, manvantara and *vaṃśānucarita*.

Vedāng-s, their names, objectives, scientific nature and some details.

Phonetics and grammar, scientific nature of pronunciation of saṁskṛta and other Indian languages.

Unit 2: Indian Philosophical Systems - part (b)

Indian preaching on *dharma, artha* and Society, *bhagavadgītā, arthaśāstra, gurukula* systems, *nālandā, takṣaśilā, vikramaśilā* etc.

The following topics in this unit are to be studied: (a) Introduction to the subject; (b) texts, authors and their contribution.

nāstika darśana : *cārvāka*, *jaina* and *bauddha darśana*

āstika darśana: *nyāya-vaiśēṣika*, *sāṁkhya* and *yōga*, *pūrvamīmāṁsā* and *uttaramīmāṁsā (vēdānta).*

Ancient Indian *gurukula* System: *nālandā, takṣaśilā, vikramaśilā, valabhī, ōdantapurī, mithilā, kāncī, nādiyā, puṣpagiri, nāgārjunakōṁḍā, śāradāpīṭha (kāśmīra), ujjain, jagaddala aura sōmapura*.

Tarkaśāstra: *pramāṇa-s; pratyakṣa, anumana, upamāna, śabda, arthāpatti* and *anupalabdhi, pramātā, pramāṇa*, *prameya* and *pramā- svātaḥpramaṇya and parataḥ pramāṇya*

Powers of words: *abhidhā, lakṣaṇā, vyañjanā, tātparya*,

Cause and fallacies- *Hetu-lakṣaṇa* and *hetvabhāsa lakṣaṇa*

Paṃca adhikaraṇa System-*viṣaya*, *saṃśaya, pūrvapakṣa*, *uttarapakṣa* and *saṃgati*

Dharma, artha and Society: Four *puruṣārtha- dharma, artha, kāma* and *mokṣa*. Definitions of each of the *puruṣārth-s* and meaning of *dharma*- Root and derivation of the word *dharma*. *dharma*: Definitions and Meanings from various texts (*mahābhārata, manusmṛti, vaiśeṣika sūtra*). *kāmya, nitya, niṣiddha, naimittika, prāyaścita* & *upāsanā*. Meaning of the word *artha- puruṣārtha;* Root and derivation and meaning. Societal outlook for *tīrthayātrā*, festivals, *saptapurī*, 12 *jyotirlinga*-s and unity of India

Bhagavadgītā: *bhagavadgītā* chapter no. 16-*daivī* and *āsurī saṃpat*

Rāmāyaṇa: Rama's qualities-as noted in *vālmīki rāmāyaṇa-maryādāpuruṣottama* Rama. Study of *kaccit sarga* and delineation of meaning in view of kingdom administration

Mahābhārata: *mahābhārata* as a storehouse of knowledge. *viduranīti* and its significant preaching on *rāja dharma*.

Arthaśāstra: *arthaśāstra*, its significance and broad introduction to subjects dealt in *arthaśāstra*. Cultural underpinnings of modern statecraft such as *yogakṣema* (welfare measures of polity-policy), *saptānga* (Seven limbs of State), *ṣadguṇa* (Six Measures of statecraft), *rāja dharma* (Duty of a King), *rājamanḍala* (Circle of kings), and *dharma* (Order) mooted in the *arthaśāstra*

Society and people: Ways as advocated in IKS texts for happiness and wellbeing of all. Concept of *svasthavṛtta*.

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Indian Languages and Literature: Indian Languages and their pronunciation system. Sanskrit Language and its Relation to Indian languages. Impact of Sanskrit literature on Indian languages for literary compositions. Literary masterpieces of Indian languages and their translations into World languages and names of their translators.

Unit 3: Astronomy

Measures of time: Divisions of time in *veda*: Year, Months and days, Names of the 13 months in Taittirīya-Brāhmaṇa. The names of 12 half-months, Lunar year of 354 days, Months and intercalary months.
General time measures, Modes of reckoning time, Lunar day, Solar day, Solar year, Luni-solar year, Civil day. Conversion of eras: Śaka to kali, Śaka to Jovian years, *vikrama-samvat* to Kali, Kollam year to Kali.

Indian Calendrical Systems: Pañcāṅga: The five elements of the calendar, Computations Nakṣatra, Tithi, Yoga, Karaṇa and Vāra. Nakṣatra of the Sun, Solar Calendar, Vikrama-saṃvat and Śālivāhana-saṃvat – National Calendar (*rāṣṭrīya dinadarśikā*).

Planetary Positions from Siddhāntik texts (Āryabhaṭīya): Computation of Ahargaṇa, Revolution number of the planets in a Mahāyuga, Finding the Mean longitude of the planets, Mandasaṃskāra, Śīghrasaṃskāra, True longitudes of the planets. Evolution of Planetary model from Āryabhaṭa to Nīlakaṇṭha (Quasi-heliocentric model). Various algorithms to determine ayanāṃśa

Planetary Positions from Karaṇa and Vākya texts: Obtaining planetary positions in a simplified algorithms given in Karaṇa texts such as Karaṇakutūhala, Grahalāghava etc. Candravākyas of Vararuci and Mādhava and Error-Correction procedure for them. Obtaining the longitudes of the Sun and the Moon using the Vākya system. Importance of Māsavākyas, Saṅkrānti-vākyas and Nakṣatra-vākyas.

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Unit 4: Health and Well-being

Scope: āyurvēdā , siddha, yōga, Folk, and Tribal Medical Practices

Folk and classical streams of medical knowledge in India: folk and tribal medicine – 8000 plants, home remedies, primary health care, bone setting, traditional birth attendants, poison healers.

āyurveda: Historical development and milestones, personalities, textual sources, regional traditions. Application of Pramāṇas in āyurveda for generation and validation of medical knowledge. Salient features – nature centric approach, person centric approach, body-mind medicine, pharmacopeia of plant, animal, and mineral sources, multi-ingredient

formulations and dosage forms, multipronged approach to treatment – lifestyle, diet, and medicine, healthy aging. Foundational concepts of *āyurveda* - Doṣadhātumalasiddhānta. Definition of health (*svastha*), daily routine (dinacaryā), seasonal routine (ṛtucaryā), good conduct (Sadvṛtta). Definition and classification of diseases – Ādhidaivika, Ādhyatmika, Ādhibhautika, sevenfold classification. Scope and variety of treatments in *āyurveda.* Eight clinical specialties of *āyurveda.* Current status of āyurveda in India and the World

Siddha: Historical development and milestones, personalities, textual sources. Foundational concepts – Tridoṣa. Pulse diagnosis. Varma treatment. Herbo-mineral formulations. Concept of health and disease, Preventive Medicine. Approaches to management of diseases. Current status of the *siddha* system of medicine in India and the world

Yoga: Historical development and milestones, personalities, textual sources. Definition of *yoga. yoga* as therapy for health and wellness. Aṣṭāṅga *yoga*. Health benefits of Āsanas. Health benefits of Prāṇāyāma. Health benefits of Meditation. Yogic methods of cleansing the body – Ṣaṭkarmas. Application of *yoga* as therapy in the modern world

Unit 5: Architecture

Indus Valley civilisation: Urban planning - Dholvira , Hindu Temple Architecture: – elementary concepts of *nagara*, *dravi.ड* and *vesarā* style temples.

Brief knowledge of Ancient and medieval structures of India: buddhā and *jaina* temples - *udayagiri – sāṁcī* - *sāranātha –nālandā*, Rock and Cave temples- *elīphaiṃṭā* - *jāgeśvarī* - *ajaṃtā* and *ellorā , himālayaṃ* Temples-*kedāranātha* -*tuṃgāmaṭha –jāgeśvara* - *bāleśvara*.

Ancient and medieval temples: muṃḍeśvarī devī temple- *daśāvatāra viṣṇu* temple, *ḍogaraha* - *khajurāho* temples- *liṃgarāja* temple, *bhubaneśvara* - *ṭerākoṭā* temple, *viṣṇupura*- temples of *bādāmī*, Aihole (*cālukyāna* temples)-kāṁcī and mahābalīpuram temples- cōla temples, Sun temples-kōṇārka, mōḍhērā, kaṭāramala (almōड़ā) and mārtaṁḍa (anaṁtanāga) *(only the elementary knowledge of architecture style, period and Deity)*

Ancient and medieval Indian Water storage and harvesting systems: - kallanaī dam- aḍalāja stepwell, ṭāṁkā techniques of Rajasthan - āhāra pāīna of Bihar.

Fundamentals of vāstu śāstra (only elementary concept)

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Unit 6: Mathematics

Geometry in Śulbasūtras: expression for the surds given in Śulbasūtra texts. Methods for obtaining a perpendicular bisector. Construction of perpendicular bisector: cord-folding method, Bodhāyana method of constructing a square, The Bodhāyana-Pythagorean theorem

Decimal place value system: Numbers in *veda,* enumeration of big numbers (koti to maha-augh, akshauhini and other named numerals) from traditional literature. Three different systems of numerations: Āryabhaṭan, Bhūtasaṅkhyā and Kaṭapayādi systems

Arithmetic and Trigonometry in Āryabhaṭīya and its further development: Square root and cube-roots, Āryabhaṭa's Sine-Table, Its modification in Tantrasaṅgraha, Mādhava series for Sine and Cosine functions, Different methods to obtain sine values from Karaṇapaddhati

Brahmagupta: Mathematics of positive, negative and zero. Solution of linear and quadratic equations. Cyclic Quadrilateral.

Līlāvatī: Arithmetical operations: Inversion method, rule of supposition. Solution of quadratic equations. Mixtures, Combinations, progressions. Plane figures: application of right triangles, Sūcī problems. Construction of a quadrilateral, cyclic quadrilaterals, value of π, area of a circle, surface area of a sphere, volume of a sphere.

Kuṭṭaka and continued fractions: Kuṭṭaka method by Āryabhaṭa and Brahmagupta. Vallyupasaṃhāra and Continued fraction, Vallyupasaṃhāra Method I and II from Karaṇapaddhati. Nearest-integer continued fraction in Dṛkkaraṇa.

Kerala School: Mādhava series for π. End-correction (Antyasaṃskāra), Different fast convergent series for π, Putumana-Somayājī series, Nīlakaṇṭha on the irrationality of π, Nīlakaṇṭha and the notion of the sum of infinite geometric series.

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Unit 7: Chemistry and Metallurgy

Sāṅkhya-Pātañjala system: (Prakṛti – The original constituents and their interactions; conservation of energy and transformation of energy; the doctrine of causation; principle of collocation, storing and liberation of energy; dissipation of energy and mass and their dissolution into formless prakṛti, the evolution of matter; the evolution of infra-atomic unit; chemical analysis and synthesis; elements and compounds.

Chemistry in the medical schools of ancient India: Physical characteristics of the Bhūtas, The Mahābhūtās, mechanical mixtures. Qualities of compounds; formation of molecular

properties in chemical compounds. Chemistry of colors, measures of weight and capacity, size of the minimum visible.

Evolution of different forms of matter (Pañcīkaraṇa) from the Vedantic view.

The atomic theory of the Buddhists and Jains.

Nyāya Vaiseśika chemical theory: theory of atomic combinations; chemical combinations, mono and hetero bhautika compounds, theory of dynamic contact (Viśṭambha), chemical action and heat, three axes of Vācaspati (graphical representation of the constitution of a bi-bhautika compound), conception of molecular motion (parispanda)

Ideas of chemistry as in bṛhatsaṁhitā: making of *vajrā lepa*/vajrasamghāta; gaṁdhayukti.

Metallurgical heritage: Arthaśāstra as the earliest text describing gold, silver and other metals; processing of gold, silver, copper, iron, tin, mercury, lead and zinc as mentioned in the Indian texts in the ancient and medieval period. Zinc distillation as mentioned in Rasārṇava and *rasaratnasamukāyā*.

Concepts of acid and bases in Indian chemistry from organic fruit, vegetable based. Acids, plant-ash based bases to mineral acids of the medieval period.

Unit 8: Life sciences, agriculture and ecology

Scope: *kṣatriya, mṛgayurveda, pākaśāstra, pavitra upavana*

Kṛṣiśāstra, vṛkṣāyurveda: Historical development and milestones, personalities, textual sources - upavana vinōda, Kṛṣiparāśara, Bṛhat Samhitā, Kṛṣi Gīta. Recreational Gardens. Agriculture in ancient India. Plant diseases and their management. Pest control, manures for plants, plant grafting techniques.

Mṛgāyurveda: Historical development and milestones, personalities, textual sources - Pālakāpyasaṃhitā, Gajāyurveda, Śālihotrasaṃhitā, Aśvāyurveda, Mṛgapakṣiśāstra. Classification and description of animals. Diagnosis and treatment of diseases

Pākaśāstra: Historical development and milestones, personalities, textual sources – Pākadarpaṇa, Bhojanakutūhala, Kṣemakutūhala, Pathyāpathyaviniścaya. Concept of a balanced diet. Sources and classification of food. Healthy and unhealthy combinations of foods. Healthy and balanced recipes. Methods of cooking. Customizing food according to place, seasons, and constitution of the individual. Eight factors to be considered to create a balanced diet. Right methods of eating. Unhealthy food habits.

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Sacred groves: tulasī, sandalwood, śamī, Ark, palāśa, khadira, *devadāru*, Betel nut, Coconut, Banana etc. About social forestry –benefits from leaves, fruits from plantation – as mentioned in famous texts. nīmba (neem), āmra, (Mango), Milk-tree-panasa (Jackfruit), aśvatthā, fig or gular, pakar (Ficus lacor) bagarāḍa; tamarind, *kapittha, bilvā ,aśokā amalaka, punnāga , śiṃśapā , saptaparṇa , saptaraṃgī,* the fruit of planting these plants-general description. āyurvedika medicine herbs, trees and plants-arjuna, *candana* (sandalwood*),* śamī, ark, palāśa, khadira, devadāru, kuṭaja , ingudī, uśīra -ghāsa, viṣamuṣṭi-general description.

Unit 9: Kala

Introduction to *bharata* muni nāṭyaśāstra & abhinaya darpaṇa. Description of *navarasā.* An account of the eight classical dances of India (bharatanāṭyam, mohinīaṭṭam, kathakalī, kucipuड़ī , katthaka , oḍisī , maṇipurī and satrīya).

Influence of *gītā goviṃdā,* The rāmāyaṇa and The mahābhārata on Indian dance and Indian paintings (madhubanī , paṭacitra , pahāड़ , kāṁgaड़ā).

Classification of Indian classical music (himdustānī and Carnatic), Major styles associated with hiṃdustānī classical music (dhrupada , khyāla, tarānā) and Carnatic Music (varṇamasa and kriṭisa). An overview of the tāla system and laya.

Introduction to the term folk, tribal and modern art forms of India. A general overview on the socio-economic background of the practiced folk, tribal, traditional, ritualistic performances (dance, music, storytelling and theater).

Introduction to regional theatrical practice- kūḍiyāṭṭama , yakṣagānā , chau , jātrā , laiharāobā , theyyama , āṃkie nāta , paṃḍavānī , ciṃdū bhagavatā , bhāṃḍa , jaśna and others. Impact of traditional texts on art forms.

Classification of Indian puppetry (kaṭaputalī , ṭholū bomlatā , rāvaṇa chāyā , tolpāvakūthū), influence of paṃcataṃtrama on puppetry tradition.

An account of the art forms and cultural festivals of India that are represented in the UNESCO's ICH list and the significance of this nomination process.

Application of Kaṭapayādi in *malakartā rāga* nomenclature; introduction to the evolutionary stages from Caturḍaṇḍi to current day concert paddhati in Carnatic music.

Unit 10: Ancient India and World

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IKS Influence in the Western World (Central Asia & Europe): Influence of saṃskṛta on ancient European Languages and their Mythologies. Influence of Indian Philosophy on Ancient Greece Thinkers: Socrates, Plato, Plotinus, Porphyry, Neo-Platonism etc. Trade with Roman Empire and other ancient civilizations. Cultural Influence in Mesopotamia, Sumeria, Kassites, Persia, Yazidis etc.

IKS Influence in the Eastern World (South East Asia): Various Kingdoms influenced by Indian Culture: Kingdom of mātarama, pagana Kingdom (849-1297 CE) (Burma), *khamera* Kingdom (802-1463 CE), *rajahaṇate* of*sebu*, ayutthāya Kingdom era (1350-1767), Sri Vijaya Empire (650 – 1377 CE) etc. Indian Influence on the Geographical Names of South-East Asia. Influence of Indian Temples and Architecture : BAYON TEMPLE in Angkor (Cambodia), PURA BESAKIH (Bali, Indonesia), PRAMBANAN (Indonesia), BATU CAVES (Selangor, Malaysia), VAT PHOU (Champassak, Laos), SRI VEERAMAKALIAMMAN (Singapore), MARIAMMAN TEMPLE (Vietnam) ETC. Influence of rāmāyaṇa and mahābhārata on paintings, theater and dance of Southeast Asia. Influence of manu smṛti on *sarasāmukkāya* (the law books of Java and Bali). Influence of Sanskrit and other Indian Languages: Brahmi Script and its impact on languages of Burma, Thai, Laos, Cambodia. Laguna Copperplate (the Philippine Islands), Siddham script in Japan etc. Influence of Hindu deities:*brahma, viṣṇu, śivā, sarasvatī*, gaṇēśa, rāma, garuड़, nāgā etc. Contact Sri Lanka and Africa: Textile, Technology, and Trade : Buddhism in Sri Lanka, Chola's influence in Sri Lanka, Literature, Jataka Stories, Africa and Indian Textile, Stone Carvers in Africa, Inscriptions from Socotra Island. Cambodia Sanskrit inscriptions

IKS influence on modern western thinkers: Emerson, Whitman and Thoreau, Christopher Isherwood, Aldous Huxley, Joseph Campbell, Alan Watts, William Somerset Maugham. Nicholas Tesla, David Bohm, William James, Beatles, George Harrison, Turiyasangitananda. Carl Sagan, Fritjof Capra, Larry Brilliant, Ram Dass, Daniel Goleman, Patrick Geddes, Dennis Waite, Leonard Bloomfield, Steve Jobs, Mark Zukerberg, Arthur Schopenhauer. Erwin Schrödinger, Ferdinand de Saussure, Noam Chomsky etc.

The impact of yoga on the World: philosophers who left an impact on the West - Swami Vivekananda, Paramahansa Yogananda, Sri Aurobindo, Maharishi Mahesh Yogi, Acharya Rajneesh, J. Krishnamurti, Swami Sivananda, BKS Iyengar, Sri Krishnamachari.

The impact of yoga on diverse fields: influence on Western art, culture and film from the 18th century, influence on Western literature

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