241/PHY/VA101-A

Value Added Course

COURSE ID: 241/PHY/VA101

INDIAN SCIENCE HISTORY

Marks (Theory): 35 **Credits: 2**

Marks (Internal Assessment): 15 **Time: 2 Hours**

Note: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist of at least 4 parts covering entire syllabus. The question paper is expected to contain problems to the extent of 20% of total marks. The examinee will be required to attempt 5 questions; selecting one question from each unit and the compulsory.

Course Outcomes:

After successful completion of the course on Indian Science History, a student will be able to:

- *Gain familiarity with the biographies of Indian scientists and the various challenges they faced in the evolution of Indian science.*
- *Learn the contribution of Indian scientists in the different disciplines of science.*

Unit-I

Physics: Bibliography of Indian scientists in the field of Physics, Work and life of CV Raman and Bhabha, History of Indian rocket technology, Indian Missile Man, History of Bose-Einstein Condensation, Contribution of Chandrasekhar and Saha in astrophysics, Evolution of Nuclear power in India, ISRO contributions.

Unit-II

Bibliography of Scientists in the field of Chemical Sciences, Contribution made by the Chemists of Ancient India like Nagarjuna and Kanada. Shanti Swaroop Bhatnagar - "Father of Research Laboratories" in India, contribution to industrial research and role in establishments of CSIR, Founder of India's first pharmaceutical company, research on pharmaceuticals.

Unit-III

Mathematics: Bibliography and contribution of Indian Mathematicians: Aryabhatta, Brahmagupta, Bhaskara I, Bhaskara II, Srinivasa Ramanujan, Shakuntala Devi

Unit-IV

Geography: Contribution of Varahamihira, Brahmagupta, Bhaskaracharya, Aryabhata and Ancient Indian Literature to the development of scientific knowledge in geography, knowledge

management in ancient India, protection of traditional knowledge, Need, and significance for protecting traditional knowledge.

References/Books:

1. Science India, Scientific Magazines by Vijnana Bharati. For details visit: https://scienceindiamag.in.
2. Everyman's Science by ISCA. For details visit: http://www.sciencecongress.nic.in.
3. Evolution of Geographical Thought, Husain, M., 2012, Rawat Publications.
4. Knowledge Traditions and Practices of India (a text book) 2012, Kapil Kapoor, Michel Danino.
5. E-resources: http://nptel.ac.in/courses/121106003.
6. Probability and Statistical Inference, Mukhopadhyay, N., 2000. Marcel Dekker, Inc. New York.

Detailed Syllabi of Pool Courses for M. Sc. (Physics)

Semester-II

Multi-Disciplinary Course

COURSE ID: 241/PHY/MD201

SPECTROSCOPIC TECHNIQUES

Marks (Theory): 50 **Credits: 3**

Marks (Internal Assessment): 25 **Time: 2 Hours**

Note: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist of at least 4 parts covering entire syllabus. The question paper is expected to contain problems to the extent of 20% of total marks. The examinee will be required to attempt 5 questions; selecting one question from each unit and the compulsory.

Course Outcomes:

After successful completion of the course on Spectroscopic Techniques, a student will be able to:

- *Understand the fundamental aspects of spectroscopy.*
- *Understand the basics, working principles and working of Optical and Thermal Characterization Techniques*

Ranjit