

2024

HISTORY OF SCIENCE AND ENGINEERING

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. a) State whether the following statements are true or false: 1 x5=5
- (i) No one can obtain a patent on a law of nature or any scientific principle.
 - (ii) The great discovery that the earth rotates around its axis is recorded in the Aryabhatiya.
 - (iii) CSIR-National Aerospace Laboratories (NAL) is located at Lucknow.
 - (iv) India's Gas Turbine Research Establishment (GTRE), is not a part of the Defence Research and Development Organisation (DRDO).
 - (v) Prithvi is a series of long-range, nuclear-capable ballistic missiles.
- b) Fill in the blanks: 1 x10=10
- (i) Atmanirbhar Bharat (Self-Reliant India) was launched by _____ in May 2020.
 - (ii) _____ is the India's first indigenously developed short-range ballistic missile.
 - (iii) Under the leadership of _____, SLV-III successfully launched Rohini, India's first indigenous satellite, into orbit in 1980.
 - (iv) the modern terms _____ and _____ are adaptations of the words *jya* and *kojya* introduced by Aryabhata.
 - (v) _____ is best remembered for his seminal composition: the *Bahmasphutasiddhanta* (theory of "the opening of the universe").
 - (vi) *Aryabhattiya* is a concise text containing _____ verses.
 - (vii) The _____ medicine system came to India along with the Mughals around the eleventh century.
 - (viii) _____ was a second century BC mathematician. He introduced practical geometry involving acute, obtuse, right angles.
 - (ix) The Kaveri Engine project was initiated in the year _____.
 - (x) Under the guidance of Dr. Vikram Sarabhai, India launched its first satellite, _____, in 1975.
- c) Write a short note on the Kaveri Engine. 5

2. Answer the following questions: (any ten) 2x10=20
- (i) Who was the founder director of the Maragha Observatory?
 - (ii) Which book gives an account of the casting of cannons in medieval period?
 - (iii) For what purpose *Rudra* was developed by HAL?
 - (iv) How many surgical instruments were mentioned in Sushrutsamhita?
 - (v) What were the three contributions in the field of mathematics of Ancient India?
 - (vi) Which book mentions plants and herbs used for medicinal purposes in Ancient India?
 - (vii) Name the two government organisations doing research for civil and defence purposes in Science & Technology.
 - (viii) Which was the first Indian space satellite?
 - (ix) What were the functions of INSAT- 1B satellite?
 - (x) When the Department of Science and Technology was set up by the Govt. of India?
 - (xi) What is Varunastra Torpedo?
 - (xii) What is the Advanced Medium Combat Aircraft (AMCA)?
3. Discuss the various scientific developments during the ancient era by Aryabhata and Brahmagupta. 20
4. What are the different concerns in R&D funding in India? What are the various steps needed to enhance R&D funding in India? 10+10=20
5. Explain the key achievements of DRDO. Discuss the contributions of Dr. Vikram Sarabhai towards India's scientific and technological advancement. 10+10=20
6. a) What do you mean by technology transfer? What are the two methods of technology transfer? How technology transfer is adopted by SMEs? 2+4+4=10
- b) Discuss the steps to apply for a patent in India. 10
7. Write short notes on the following (any two): 10x2=20
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| i) Atmanirbhar Bharat | ii) Invention of Agriculture |
| iii) CSIR | iv) Achievements of Sir CV Raman |