



SRM VALLIAMMAI ENGINEERING COLLEGE

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SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF PHYSICS

QUESTION BANK

MGE202 & HISTORY OF SCIENCE AND TECHNOLOGY IN INDIA



VII SEMESTER

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Prepared by

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QUESTION BANK

Subject Code & Name: MGE202 & HISTORY OF SCIENCE AND TECHNOLOGY IN INDIA

Sem / Year : VII / IV

UNIT I - HISTORICAL PERSPECTIVE OF SCIENCE AND TECHNOLOGY				
The nature of science and technology, Roots of science and technology in India, Science and society, Science and Technology-Meaning, Scope and Importance, Interaction of science, technology & society, Indian contribution to science and technology (from Ancient to Modern). Aryabhata, Charaka, Bhaskara II, Sushruta, J C Bose, C V Raman, Homi J Bhaba, Dr APJ Abdul kalam.				
Sl. No.	Question	CO	BT Level	Competence
1.	Define science	CO1	BTL1	Remember
2.	What is technology?	CO1	BTL1	Remember
3.	What is meant by science and society?	CO1	BTL1	Remember
4.	State any two characteristics of science.	CO1	BTL1	Remember
5.	Mention any two contributions of Aryabhata.	CO1	BTL1	Remember
6.	Write any two contributions of Charaka.	CO1	BTL1	Remember
7.	State any two achievements of Sushruta.	CO1	BTL1	Remember
8.	Name any two scientific contributions of J. C. Bose.	CO1	BTL1	Remember
9.	Mention any two discoveries of C. V. Raman.	CO1	BTL1	Remember
10.	List any two contributions of Dr. A. P. J. Abdul Kalam.	CO1	BTL1	Remember
11.	How are science and technology related to each other?	CO1	BTL2	Understanding
12.	Explain the importance of science and technology in society	CO1	BTL2	Understanding
13.	What is the significance of technology in daily life	CO1	BTL2	Understanding
14.	How did Aryabhata contribute to Indian science?	CO1	BTL2	Understanding
15.	State the contribution of Bhaskara II to mathematics and astronomy.	CO1	BTL1	Remember
16.	How did Charaka contribute to medical science?	CO1	BTL2	Understanding

17.	How did Sushruta contribute to surgery?	CO1	BTL2	Understanding
18.	What was J. C. Bose's contribution to science?	CO1	BTL1	Remember
19.	Briefly explain the role of Sushruta in the development of surgery.	CO1	BTL2	Understanding
20.	Explain the significance of the Raman Effect.	CO1	BTL2	Understanding

PART B

Sl. No.	Question	CO	BT Level	Competence
1.	Discuss in detail on the meaning, nature, and scope of science and technology to analyze their role in addressing societal challenges.	CO1	BTL3	Applying
2.	Discuss the roots of science and technology in India from ancient to modern times.	CO1	BTL3	Applying
3.	Explain the relationship between science, technology, and society with Indian examples.	CO1	BTL4	Analysing
4.	Describe the contributions of important Indian scientists from ancient to modern India.	CO1	BTL4	Analysing
5.	a) Discuss India's contribution to science and technology. b) Suggest ways to develop scientific temper.	CO1	BTL3 BTL4	Applying Analysing
6.	a) Write a short note on Dr. A.P.J. Abdul Kalam b) Discuss his contributions to Indian Science & Technology.	CO1	BTL3 BTL4	Applying Analysing
7.	Explain the role of J. C. Bose in the development of modern science	CO1	BTL3	Applying
8.	Illustrate how Aryabhata's contributions can be used to explain modern concepts in astronomy and mathematics.	CO1	BTL3	Applying
9.	Analyze the impact of the contributions of ancient Indian scientists on contemporary scientific and technological progress.	CO1	BTL4	Analysing
10.	Apply the concept of science–society interaction to explain the technological progress of modern India.	CO1	BTL3	Applying

UNIT II - SCIENCE AND TECHNOLOGY IN MEDIEVAL INDIA

Scientific and Technological Developments in Medieval India; Influence of the Islamic world and Europe; The role of maktabas, madrasas and karkhanas set up. Developments in the fields of Mathematics, Chemistry, Astronomy and Medicine. Innovations in the field of agriculture - new crops introduced new techniques of irrigation etc

Sl. No.	Question	CO's	BT Level	Competence
1.	What is meant by medieval India?	CO2	BTL1	Remembering
2.	Define maktab.	CO2	BTL1	Remembering
3.	Define madrasa.	CO2	BTL1	Remembering
4.	What were karkhanas?	CO2	BTL1	Remembering
5.	Mention any two scientific fields that developed in medieval India.	CO2	BTL1	Remembering
6.	Name two crops introduced or widely spread in medieval India.	CO2	BTL1	Remembering
7.	What is irrigation?	CO2	BTL1	Remembering
8.	What was the Persian wheel?	CO2	BTL1	Remembering
9.	Mention one influence of the Islamic world on medieval Indian science.	CO2	BTL1	Remembering
10.	Mention one influence of Europe on medieval Indian technology.	CO2	BTL1	Remembering
11.	Explain the role of madrasas in medieval Indian education	CO2	BTL1	Understanding
12.	How did karkhanas contribute to technological development?	CO2	BTL1	Understanding
13.	Explain how contact with the Islamic world and Europe enriched Indian scientific knowledge.	CO2	BTL2	Understanding
14.	How did astronomy develop in medieval India?	CO2	BTL2	Understanding
15.	What was the importance of mathematics in medieval India?	CO2	BTL2	Understanding
16.	Outline the development of chemistry in medieval India.	CO2	BTL2	Understanding
17.	How did new crops affect medieval Indian agriculture?	CO2	BTL2	Understanding
18.	What is the use of canals in medieval Indian irrigation?	CO2	BTL2	Understanding

19.	Differentiate between the institutional roles of a maktab and a madrasa.	CO2	BTL2	Understanding
20.	Briefly describe how irrigation innovations improved agricultural productivity during the medieval period.	CO2	BTL2	Understanding
PART B				
1.	Explain the scientific and technological developments in medieval India.	CO2	BTL3	Applying
2.	Discuss the role of maktabas, madrasas and karkhanas in promoting education and technology.	CO2	BTL3	Applying
3.	Explain the developments in mathematics and astronomy during Medieval India.	CO2	BTL4	Analysing
4.	Write in detail about innovations in agriculture during the medieval period.	CO2	BTL3	Applying
5.	Explain the influence of the Islamic world on scientific development in India.	CO2	BTL4	Analysing
6.	Discuss the progress made in medicine and chemistry during Medieval India.	CO2	BTL4	Analysing
7.	Explain the importance of irrigation techniques introduced during the medieval period.	CO2	BTL3	Applying
8.	Illustrate the contribution of educational institutions to scientific learning in Medieval India.	CO2	BTL3	Applying
9.	Apply the agricultural innovations of Medieval India to improve present-day farming practices.	CO2	BTL3	Applying
10.	Show how the educational practices of maktabas and madrasas contributed to the spread of scientific knowledge.	CO2	BTL3	Applying

UNIT III SCIENCE AND TECHNOLOGY IN COLONIAL INDIA

Early European Scientists in Colonial India- Surveyors, Botanists, Doctors, under the Company's Service- Indian Response to new Scientific Knowledge, Science and Technology in Modern India- Development of research organizations like CSIR and DRDO; Establishment of Atomic Energy Commission; Launching of the space satellites.

Sl. No.	Question	CO	BT Level	Competence
1.	List the early European scientists in Colonial India.	CO3	BTL1	Remembering
2.	Identify the role of surveyors in Colonial India.	CO3	BTL1	Remembering
3.	Name the function of botanists in Colonial India.	CO3	BTL1	Remembering
4.	State the role of doctors under Company service.	CO3	BTL1	Remembering
5.	List two scientific fields developed during colonial period.	CO3	BTL1	Remembering
6.	Identify one objective of colonial scientific studies.	CO3	BTL1	Remembering
7.	Name the organization responsible for defence research in India.	CO3	BTL1	Remembering
8.	Mention one major scientific organization in modern India.	CO3	BTL1	Remembering
9.	Identify the role of Atomic Energy Commission.	CO3	BTL1	Remembering
10.	Mention one area of modern scientific development in India.	CO3	BTL1	Remembering
11.	Classify the types European scientists in Colonial India.	CO3	BLT2	Understanding
12.	Distinguish between surveyors and botanists in colonial science.	CO3	BLT2	Understanding
13.	What was the Indian response to European scientific knowledge.	CO3	BTL1	Remembering
14.	Infer the purpose of scientific surveys in colonial India.	CO3	BLT2	Understanding
15.	Classify modern Indian scientific organizations.	CO3	BLT2	Understanding
16.	Brief the role of DRDO.	CO3	BLT2	Understanding
17.	What is the importance of CSIR in India.	CO3	BTL1	Remembering
18.	What is the role of Atomic Energy Commission.	CO3	BTL1	Remembering
19.	Identify how colonial medicine influenced India.	CO3	BLT2	Understanding
20.	Distinguish colonial science from modern Indian science.	CO3	BLT2	Understanding

PART B

1.	Describe the contributions of early European scientists in Colonial India.	CO3	BTL4	Analysing
2.	Discuss the role of surveyors, botanists and doctors during the colonial period.	CO3	BTL4	Analysing

3.	Explain the establishment and objectives of CSIR and DRDO.	CO3	BTL3	Applying
4.	Write in detail about the development of atomic energy and space research in India.	CO3	BTL3	Applying
5.	Explain the Indian response to new scientific knowledge during Colonial India.	CO3	BTL3	Applying
6.	Discuss the significance of research organizations in scientific development.	CO3	BTL4	Analysing
7.	Explain the role of the Atomic Energy Commission in national development.	CO3	BTL3	Applying
8.	Illustrate the importance of India's satellite programmes.	CO3	BTL3	Applying
9.	Apply the functions of CSIR and DRDO to explain their role in solving national problems.	CO3	BTL3	Applying
10.	Show how scientific institutions established during Colonial India contributed to modern technological growth.	CO3	BTL4	Analysing

UNIT IV IMPACT OF SCIENCE AND TECHNOLOGY IN MAJOR AREAS

Space – Objectives of space programs, Geostationary Satellite Services – INSAT system and INSAT services remote sensing applications, Launch Vehicle Technology; Ocean Development – Objectives of ocean development, Biological and mineral resources, Marine research and capacity building. Defence Research – Spin-off technologies for civilian use, Biotechnology – Applications of biotechnology in medicine, Biocatalysts, Agriculture, Food, Fuel and Fodder, Development of biosensors and animal husbandry; Energy – Research and development in conservation of energy, India's nuclear energy program, technology spin-offs

Sl. No.	Question	CO	BT Level	Competence
1.	What objectives can we list as the main focus of India's space program?	CO4	BTL1	Remembering
2.	Which satellite system can we name as India's geostationary communication network?	CO4	BTL1	Remembering
3.	What key application can we identify as a major use of remote sensing satellites?	CO4	BTL1	Remembering
4.	What key purpose does India aim to achieve by developing its own launch-vehicle technology?	CO4	BTL1	Remembering
5.	Which two types of ocean resources can we recall as central to ocean development studies	CO4	BTL1	Remembering
6.	How can we define a biosensor within biotechnology?	CO4	BTL1	Remembering
7.	Which defence related innovation can we recognize as a civilian spin off?	CO4	BTL1	Remembering
8.	Which biotechnology application in agriculture can we identify as widely used?	CO4	BTL1	Remembering
9.	What contributions to animal husbandry can we list from biotechnology?	CO4	BTL1	Remembering
10.	What major goal can we state for India's nuclear energy program?	CO4	BTL1	Remembering
11.	How can we classify the services provided by the INSAT satellite system?	CO4	BTL2	Understanding
12.	How can we compare geostationary satellites with remote sensing satellites?	CO4	BTL2	Understanding
13.	How can we summarize the mission of India's ocean development efforts?	CO4	BTL2	Understanding
14.	What can we infer about the need for capacity building in marine science?	CO4	BTL2	Understanding
15.	How can we interpret biotechnology's role in strengthening food systems?	CO4	BTL2	Understanding
16.	How can we distinguish marine biological resources from marine mineral resources?	CO4	BTL2	Understanding

17.	How can we outline the importance of biocatalysts in biotechnology?	CO4	BTL2	Understanding
18.	How can we restate the value of remote sensing for environmental monitoring?	CO4	BTL2	Understanding
19.	What benefit of defence spin off technologies for civilian disaster response can we identify?	CO4	BTL2	Understanding
20.	What key differences can we identify between energy-conservation research and nuclear-energy development?	CO4	BTL2	Understanding

PART B

1.	Describe the objectives and achievements of India's space programme.	CO4	BTL4	Analysing
2.	Discuss the INSAT system and its services.	CO4	BTL3	Applying
3.	Explain the in detail on the importance of India's space programme.	CO4	BTL3	Applying
4.	Write in detail about the applications of biotechnology in various sectors.	CO4	BTL3	Applying
5.	Explain the role of remote sensing in national development.	CO4	BTL3	Applying
6.	Analyze the opportunities and challenges associated with the utilization of marine biological and mineral resources.	CO4	BTL4	Analysing
7.	Explain the applications of biotechnology in medicine and agriculture.	CO4	BTL3	Applying
8.	Analyse the importance of India's nuclear energy programme.	CO4	BTL4	Analysing
9.	Apply remote sensing technology to address environmental and resource management issues.	CO4	BTL3	Applying
10.	Show how biotechnology can be applied to improve food production and healthcare.	CO4	BTL3	Applying

UNIT V NEXUS BETWEEN TECHNOLOGY TRANSFER AND DEVELOPMENT

Transfer of Technology – Types, Methods, Mechanisms, Process, Channels and Techniques, Appropriate technology- Criteria and selection of Appropriate technology: Technology assessment, Technological forecasting, Technological innovations and barriers of technological change. Social implications of new technologies like the Information Technology and Biotechnology.

Sl. No.	Question	CO's	BT Level	Competence
1.	What is technology transfer?	CO5	BTL1	Remembering
2.	Define appropriate technology.	CO5	BTL1	Remembering
3.	What is meant by technological innovation?	CO5	BTL1	Remembering
4.	Mention any two types of technology transfer.	CO5	BTL1	Remembering
5.	What is technology assessment?	CO5	BTL1	Remembering
6.	What is technological forecasting?	CO5	BTL1	Remembering
7.	State any two channels of technology transfer.	CO5	BTL1	Remembering
8.	What is information technology?	CO5	BTL1	Remembering
9.	What is biotechnology?	CO5	BTL1	Remembering
10.	Mention any two barriers to technological change.	CO5	BTL1	Remembering
11.	Explain the difference between technology transfer and technology diffusion.	CO5	BTL2	Understanding
12.	Why is technology transfer important for development?	CO5	BTL2	Understanding
13.	What is the role of patents in technology transfer?	CO5	BTL2	Understanding
14.	Clarify licensing as a method of technology transfer.	CO5	BTL2	Understanding
15.	What is a joint venture in technology transfer?	CO5	BTL2	Understanding
16.	what is called the concept of imported technology.	CO5	BTL2	Understanding
17.	Why should technology be adapted to local conditions?	CO5	BTL2	Understanding
18.	Mention the criteria for selecting appropriate technology.	CO5	BTL2	Understanding

19.	How does information technology support development?	CO5	BTL2	Understanding
20.	How can biotechnology help Indian agriculture?	CO5	BTL2	Understanding
PART B				
1.	Describe the concept and importance of technology transfer.	CO5	BTL3	Applying
2.	Discuss the types and methods of technology transfer.	CO5	BTL3	Applying
3.	Explain the criteria for selecting appropriate technology.	CO5	BTL4	Analysing
4.	Write in detail about technological forecasting and technology assessment.	CO5	BTL3	Applying
5.	Explain the process and channels of technology transfer.	CO5	BTL4	Analysing
6.	Discuss the significance of appropriate technology in national development.	CO5	BTL4	Analysing
7.	Explain the barriers to technological change.	CO5	BTL3	Applying
8.	Illustrate the social implications of information technology and biotechnology.	CO5	BTL3	Applying
9.	Apply the principles of technology transfer to promote industrial development in India.	CO5	BTL3	Applying
10.	Show how technology assessment can be used to evaluate the impact of a new technology on society.	CO5	BTL3	Applying