

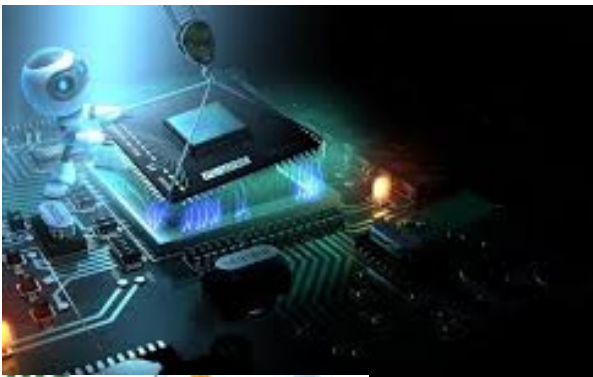
# UPSC

**MAIN EXAM REVISED STUDY MATERIALS**

## GENERAL STUDIES

### PAPER - III

**(Technology, Economic Development, Bio diversity, Environment, Security & Disaster Management)**



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**(Technology, Economic Development, Bio diversity, Environment, Security & Disaster Management)**

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## **GENERAL STUDIES - III**

**(Technology, Economic Development, Bio diversity, Environment, Security & Disaster Management)**

### **SYLLABUS GENERAL STUDIES- III**

#### **Technology, Economic Development, Bio diversity, Environment, Security and Disaster Management.**

Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment.

Inclusive growth and issues arising from it.

Government Budgeting.

Major crops cropping patterns in various parts of the country, different types of irrigation and irrigation systems storage, transport and marketing of agricultural produce and issues and related constraints; e-technology in the aid of farmers

Issues related to direct and indirect farm subsidies and minimum support prices; Public Distribution System- objectives, functioning, limitations, revamping; issues of buffer stocks and food security; Technology missions; economics of animal-rearing.

Food processing and related industries in India- scope and significance, location, upstream and downstream requirements, supply chain management.

Land reforms in India.

Effects of liberalization on the economy, changes in industrial policy and their effects on industrial growth.

Infrastructure: Energy, Ports, Roads, Airports, Railways etc.

Investment models.

Science and Technology- developments and their applications and effects in everyday life

Achievements of Indians in science & technology; indigenization of technology and developing new technology.

Awareness in the fields of IT, Space, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.

Conservation, environmental pollution and degradation, environmental impact assessment

Disaster and disaster management.

Linkages between development and spread of extremism.

Role of external state and non-state actors in creating challenges to internal security.

Challenges to internal security through communication networks, role of media and social networking sites in internal security challenges, basics of cyber security; money-laundering and its prevention

Security challenges and their management in border areas; linkages of organized crime with terrorism

Various Security forces and agencies and their mandate



# TECHNOLOGY

## SCIENCE AND TECHNOLOGY

### Developments and their applications and effects in everyday life

In India there has been a long and distinct tradition of scientific research and technological advancement since ancient times. Since independence, we have accelerated our speed and efforts in this field and have established many research laboratories, institutions of higher learning and technical education. The results have been such as would make anybody's heart swell with pride, confidence and a sense of fulfillment. The best, however, is yet to come.

The central and state governments, various public and private sector establishments are engaged in scientific research and technological development to take the nation on the path of rapid development, growth and prosperity. There are about 200 research laboratories spread all over the country. The institutions of higher learning, and universities, the modern temples of learning, are all committed to take the country forward. They are well equipped and staffed to secure for the people of the nation all the blessings and benefits that can accrue from the acquisition and application of scientific knowledge and technology. But there is no room for complacency, for in this field only the sky is the limit and we are yet a developing country.

Our technology policy is comprehensive and well thought out. It aims at developing indigenous technology to ensure efficient absorption and adoption of imported technology suitable to national priorities and availability of resources. Its main objective is attainment of technical competence and self-reliance, leading to reduction in vulnerability in strategic and critical areas. With a view to strengthening our economy and industrial development, our government has introduced many structural reforms through adoption of a new industrial policy which has an important bearing on the programmes of development pertaining to science and technology. Consequently, technology has become our mainstay enterprise and now we have built a strong and reliable infrastructure for research, training and development in science and technology.

In the field of agriculture, our scientific and technological researches have enabled us to be self-reliant and self-sufficient

in food grains. Today, we can withstand droughts and natural calamities with much greater confidence than ever before. Now, we are in a position to export food grains, etc. and are on the threshold of white and blue revolutions. Thanks to our agricultural scientists and farmers, always ready to imbibe new technologies, we have many varieties of hybrid seeds, crop-protection technologies, balanced farming practices and better water and irrigation management techniques. Similarly in the field of industrial research, we have achieved many milestones and India is emerging as a major industrial power of the world. The Council of Scientific and Industrial Research (CSIR), with its network of research laboratories and institutions, has been chiefly instrumental in our major achievements in scientific and industrial research. We have now joined the exclusive club of six advanced nations by developing our own super computer at the Centre for Development of Advance Computing (C-CAD) at Pune.

Our Atomic Research Commission, set up in 1948, is engaged in valuable nuclear research for peaceful purposes. The executive agency for implementing atomic energy programmes is the Department of Atomic Energy. The Bhabha Atomic Research Centre, Trombay, near Mumbai is the biggest single scientific establishment in the country, directing nuclear research. Now, we have five research reactors, including Cirus, Dhruva, Zerina and Purnima. We have carried out two underground nuclear tests at Pokharan in Rajasthan. This is a remarkable achievement by our nuclear scientists, which has enabled us to become one of the selected few countries of the world to have done it. India is also the first developing country, and one of the seven countries of the world to master fast breeding technology. Research in breeder technology is currently going on at Indira Gandhi Centre for Atomic Research at Kalpakkam, Chennai.

The successful launching of Polar Space Launching Vehicle (PSLV-D-2), in October 1994, marked India's entry into the league of the world's major space powers. In the INSAT-2 series of satellites, launched first in 1992, India has shown its ability to fabricate complex systems comparable to anything made anywhere in the world. Our previous launches of the SLV-3 and the SLV were merely stepping stones to what will be the workhorses of

the business, the PSLV, which can launch one tone satellite into orbit of up to 1000 km, and the Geosynchronous Satellite Launch Vehicle, which can take 2.5 tonne satellite to orbits 36,000 km away. India's space programme rocketed to greater heights with the successful launch of the second Geosynchronous Satellite Launch Vehicle (GSLV-D2) in May, 2003. As has been rightly observed, the challenge before Indian Space Research Organisation (ISRO) is to maintain the momentum of the programme by integrating it with other missions. The most obvious ones are related to military communication and reconnaissance.

Our success on Antarctica speaks volumes of our scientific genius and technological wisdom in the field. So far, 13 scientific expeditions by our oceanographers, scientists and technicians have been to Antarctica and we have two permanent stations on the icy continent.

In the field of defence also our achievements have been quite laudable. The successful production of such missiles as Prithvi and Nag testify to the high capabilities and achievements of our scientists. We have also been successful in producing opt-electronic fire control and night-vision devices required for our indigenous tanks. The HAL at Bangalore has already produced Advanced Light Helicopter (ALH).

### **TECHNOLOGY POLICY**

Technology Policy Statement (TPS) was formulated in 1983 with the basic objective of developing indigenous technology and ensuring efficient absorption and adaptation of imported technology appropriate to national priorities and availability of resources. It is aimed at attaining technical competence and self-reliance, reducing vulnerability particularly in strategic and critical areas and making maximum use of indigenous resources. The TPS also aims at using traditional skills and capabilities making them commercially competitive.

Several other measures through technology-intervention are envisaged to optimise demand on energy and ensure harmony with the environment. With a view to strengthening the economy, structural reforms have been introduced through adoption of a new industrial policy which will have an important bearing on the programmes of development pertaining to science and technology. A Technology Policy is being formulated to provide focus on the development of indigenous technologies and to make India self-reliant and competitive in the technological field.

### **Science and Technology Policy 2003**

Hon'ble then President of India, Dr. A.P.J. Abdul Kalam "Today India has become one of the strongest in the world in terms of scientific manpower in capability and maturity. Hence, we are

in a position not only to understand the technologies that we may have to borrow, but also to create our own technologies with extensive scientific inputs of indigenous origin. Basically we have come a long way since our independence, from mere buyers of technology to those of who have made science and technology as an important contributor for national development and societal transformation. In a world where the powers are determined by their share of the world's knowledge, reflected by patents, papers and so on, the WTO starts to play a crucial role in the economic development. It is important for India to put all her acts together to become a continuous innovator and creator of science and technology intensive products".

### **A - PREAMBLE**

Science and technology have profoundly influenced the course of human civilization. Science has provided us remarkable insights into the world we live in. The scientific revolutions of the 20th century have led to many technologies, which promise to herald wholly new eras in many fields. As we stand today at the beginning of a new century, we have to ensure fullest use of these developments for the well being of our people.

Science and technology have been an integral part of Indian civilization and culture over the past several millennia. Few are aware that India was the fountainhead of important foundational scientific developments and approaches. These cover many great scientific discoveries and technological achievements in mathematics, astronomy, architecture, chemistry, metallurgy, medicine, natural philosophy and other areas. A great deal of this traveled outwards from India. Equally, India also assimilated scientific ideas and techniques from elsewhere, with open-mindedness and a rational attitude characteristic of a scientific ethos. India's traditions have been founded on the principles of universal harmony, respect for all creation and an integrated holistic approach. This background is likely to provide valuable insights for future scientific advances. During the century prior to Independence, there was an awakening of modern science in India through the efforts of a number of outstanding scientists. They were responsible for great scientific advances of the highest international caliber.

In the half century since Independence, India has been committed to the task of promoting the spread of science. The key role of technology as an important element of national development is also well recognised. The Scientific Policy Resolution of 1958 and the Technology Policy Statement of 1983 enunciated the principles on which the growth of science and technology in India has been based over the past several decades.