# Science and Technology

## Unit I: Science and Technology

### Chapter 1: Development of Science and Technology in the Past, Present, and Future

- 1.1 Ancient Indian Science and Technology
- 1.2 Medieval and Colonial Era Contributions
- 1.3 Post-Independence Developments
- 1.4 Future Trends and Prospects

### Chapter 2: Various Organizations, Institutions, and Departments for the Development of Science and Technology

- 2.1 Indian Institutes of Technology (IITs)
- 2.2 Council of Scientific and Industrial Research (CSIR)
- 2.3 Department of Science and Technology (DST)
- 2.4 Indian Space Research Organisation (ISRO)
- 2.5 Other Key Organizations

## Unit II: Energy

### Chapter 3: Structure of Energy Development in India: Renewable and Non-Renewable Energy

- 3.1 Overview of Energy Resources
- 3.2 Development of Renewable Energy (Solar, Wind, Biomass)
- 3.3 Non-Renewable Energy (Coal, Oil, Natural Gas)
- 3.4 Energy Policy and Planning

### Chapter 4: Nuclear Energy, Nuclear Fuel, Radioactive Elements, and Radioactivity

- 4.1 Basics of Nuclear Energy
- 4.2 Nuclear Fuel Cycle
- 4.3 Radioactive Elements and their Properties
- 4.4 Applications and Safety Measures

### Chapter 5: Nuclear Diplomacy

- 5.1 India's Nuclear Program
- 5.2 International Nuclear Agreements
- 5.3 India's Stance on Nuclear Non-Proliferation

# Science and Technology

## Unit III: Space Technology

### Chapter 6: Various Institutional Setups for Space Research and the Concept of Orbits and Launch Stations

- 6.1 Structure of ISRO and its Centers
- 6.2 Basics of Orbital Mechanics
- 6.3 Launch Stations and Facilities

### Chapter 7: Satellite and Launch Vehicle Technology with India's Space Observations

- 7.1 Development of Satellite Technology
- 7.2 Indian Satellites and their Missions
- 7.3 Launch Vehicle Evolution

### Chapter 8: Outer Space Affairs and Various National and International Space Missions

- 8.1 International Space Law and Governance
- 8.2 Major International Space Missions
- 8.3 India's Participation in Global Space Initiatives

## Unit IV: Communication and Information Technology

### Chapter 9: Various Regulatory Bodies and Government Programs on ICT

- 9.1 Overview of ICT in India
- 9.2 Key Regulatory Bodies (TRAI, MeitY)
- 9.3 Government Initiatives and Programs

### Chapter 10: Technical Aspect of Information and Communication Technology

- 10.1 ICT Infrastructure
- 10.2 Networking and Telecommunications
- 10.3 Software and Hardware Aspects

### Chapter 11: Internet, Global Internet Governance Network, and Their Various Applications

- 11.1 Structure of the Internet
- 11.2 Global Internet Governance
- 11.3 Applications of the Internet

# Science and Technology

## Chapter 12: ICT-Based Issues

- 12.1 Digital Divide
- 12.2 Privacy and Data Protection
- 12.3 Cyber Laws and Ethics

## Chapter 13: Cyber Security

- 13.1 Basics of Cyber Security
- 13.2 Threats and Vulnerabilities
- 13.3 Security Measures and Best Practices

## Chapter 14: Fundamentals of Computers

- 14.1 Computer Hardware and Software
- 14.2 Operating Systems and Applications
- 14.3 Basic Troubleshooting

## Unit V: Defense Technology

## Chapter 15: Defense Technology

- 15.1 Overview of Defense Technology
- 15.2 India's Defense Technology Developments
- 15.3 Emerging Technologies in Defense

## Unit VI: Artificial Intelligence, Robotics, Nanotechnology

## Chapter 16: Artificial Intelligence

- 16.1 Basics of AI
- 16.2 Applications of AI in Various Fields
- 16.3 Ethical and Social Implications

## Chapter 17: Robotics

- 17.1 Fundamentals of Robotics
- 17.2 Robotics Applications in Industry and Healthcare
- 17.3 Future Trends in Robotics

## Chapter 18: Nanotechnology

- 18.1 Introduction to Nanotechnology
- 18.2 Applications in Medicine, Electronics, and Energy
- 18.3 Challenges and Safety Concerns

## Unit VII: Intellectual Property Rights (IPR) and Related Rights

### Chapter 19: Intellectual Property Rights (IPR) and Related Rights

- 19.1 Types of Intellectual Property
- 19.2 Patent Laws and Procedures
- 19.3 Copyrights, Trademarks, and Trade Secrets

## Unit VIII: Universe and Particle Physics

### Chapter 20: Universe

- 20.1 Structure and Components of the Universe
- 20.2 Cosmology and Theories of the Universe
- 20.3 Observational Astronomy

### Chapter 21: Particle Physics

- 21.1 Basics of Particle Physics
- 21.2 Fundamental Particles and Forces
- 21.3 Experimental Techniques and Discoveries

## Unit IX: Biotechnology

### Chapter 22: Fundamental Concepts of Biotechnology

- 22.1 Basics of Biotechnology
- 22.2 Genetic Engineering and Recombinant DNA Technology
- 22.3 Applications in Agriculture and Medicine

### Chapter 23: Advances in Biotechnology

- 23.1 Recent Developments in Biotechnology
- 23.2 Biotech Innovations and Industry Trends
- 23.3 Ethical Considerations

## Unit X: Diseases and Various Vaccination Programs

### Chapter 24: Recent Health and Wellness Programs Including Various Types of Diseases

- 24.1 Overview of Major Diseases
- 24.2 Public Health Programs and Policies

- 24.3 Wellness Initiatives

### Chapter 25: Corona Diary: Covid-19 - History and Updates

- 25.1 Covid-19 Overview
- 25.2 Vaccine Development and Deployment
- 25.3 Societal and Economic Impact

## Unit XI: Miscellaneous Topics

### Chapter 26: Miscellaneous Topics

- 26.1 Climate Change and Environmental Issues
- 26.2 Sustainable Development Goals
- 26.3 Innovations in Transportation and Smart Cities