



Syllabus

Prelims



- General Science

Mains

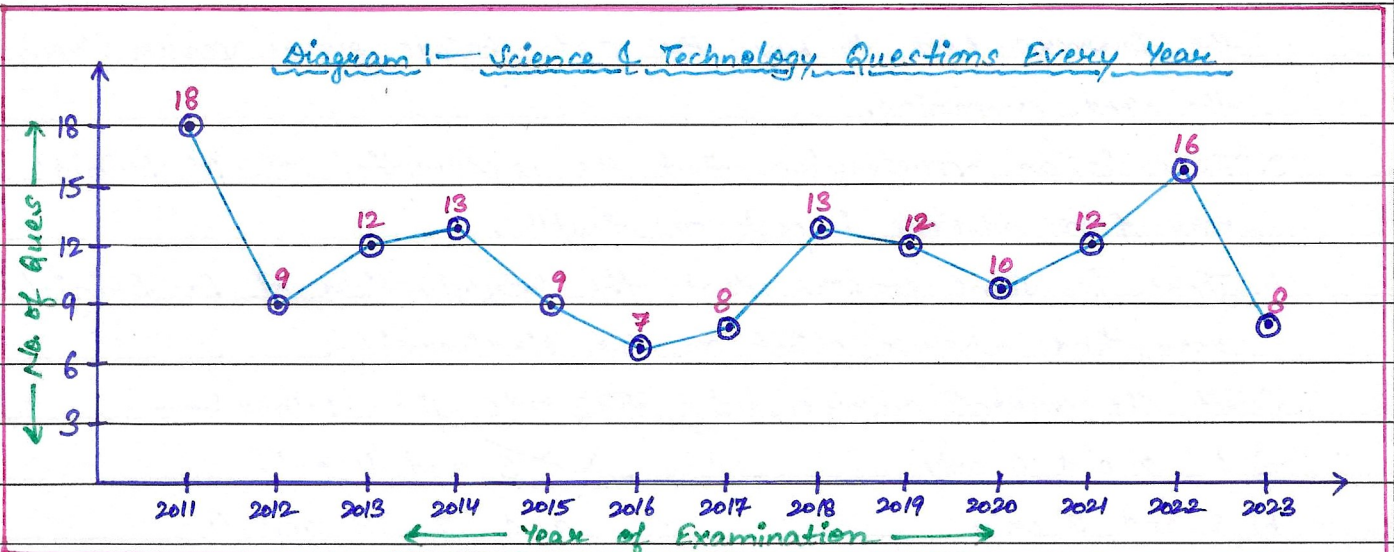


- Science and Technology - developments & their applications and effects in everyday life.
- Achievements of Indians in Science and Technology; indigenization of technology, and developing new technology.
- Awareness in the field of IT, Space, Computers, robotics, nano-technology, bio-technology, and issues relating to intellectual property rights.

Trend - Analysis (Prelims)

Science & Technology Prelims Examination Trend Analysis (2011-2023)													
Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
No. of Questions	18	9	12	13	9	7	8	13	12	10	12	16	8

Diagram 1 - Science & Technology Questions Every Year





Trend Analysis (Mains)

Science & Technology Mains Examination Trend Analysis (2013-2023)											
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
No. of Questions	4	3	6	3	2	3	4	4	3	3	3
(Marks)	(40)	(37.5)	(75)	(37.5)	(25)	(35)	(50)	(50)	(40)	(40)	(35)

Some Previous Years' Prelims Questions (S & T)

- Q1) An artificial satellite orbiting around the Earth does not fall down. This is because the attraction of Earth (2011)
- does not exist at such distance
 - is neutralized by the attraction of the moon
 - provides the necessary speed for its steady motion.
 - provides the necessary acceleration for its motion.

- Q2) What are the reasons for the people's resistance to the introduction of Bt Brinjal in India? (2012)
- Bt Brinjal has been created by inserting a gene from a soil fungus into its genome.
 - The seeds of Bt Brinjal are terminator seeds and therefore, the farmers have to buy the seeds before every season from the seed companies.
 - There is an apprehension that the consumption of Bt Brinjal may have adverse impact on health.
 - There is some concern that the introduction of Bt Brinjal may have adverse effect on the biodiversity.

Select the correct answer using the code given below:—

- 1, 2 and 3 only
- 2 and 3 only
- 3 and 4 only
- 1, 2, 3 and 4



Q(3) Consider the following minerals:—

(2013)

1. Calcium
2. Iron
3. Sodium

Which of the minerals given above is/are required by human body for the contraction of muscles?

- a) 1 only
- b) 2 and 3 only
- c) 1 and 3 only
- d) 1, 2 and 3

Q(4) Consider the following pairs:—

(2014)

<u>Vitamin</u>		<u>Deficiency disease</u>
1. Vitamin C	:	Scurvy
2. Vitamin D	:	Rickets
3. Vitamin E	:	Night Blindness

Which of the pairs given above is/are correctly matched?

- a) 1 and 2 only
- b) 3 only
- c) 1, 2 and 3
- d) None

Q(5) With reference to the use of nano-technology in health sector, which of the following statements is/are correct?

1. Targeted drug delivery is made possible by nano-technology.
2. Nano-technology can largely contribute to gene therapy.

Select the correct answer using the code given below:— (2015)

- a) 1 only



- b) 2 only
~~c) Both 1 and 2~~
 d) Neither 1 nor 2

Q(6) "Project Loon" sometimes seen in the news, is related to (2016)

- a) waste management technology
~~b) wireless communication technology~~
 c) solar power production technology
 d) water conservation technology

Q(7) Consider the following pairs:— (2017)

<u>Commonly used / Consumed materials</u>	<u>Unwanted or Controversial Chemicals likely to be found in them</u>
1. Lipstick	- Lead
2. Soft drinks	- Brominated vegetable oils
3. Chinese fast food	- Monosodium glutamate

Which of the pairs given above is/are correctly matched?

- a) 1 only
 b) 2 and 3 only
 c) 1 and 3 only
~~d) 1, 2 and 3~~

Q(8) Consider the following:— (2018)

- | | |
|-----------------|-----------------|
| 1. Birds | 3. Rain |
| 2. Dust blowing | 4. Wind blowing |

Which of the above spread plant diseases?



- a) 1 and 3 only
- b) 3 and 4 only
- c) 1, 2 and 4 only
- d) 1, 2, 3 and 4

Q(9) Recently, scientists observed the merger of giant 'blackholes' billions of light-years away from the Earth. What is the significance of this observation? (2019)

- a) 'Higgs boson particles' were detected.
- b) 'Gravitational waves' were detected.
- c) Possibility of inter-galactic space travel through 'wormhole' was confirmed.
- d) It enabled the scientists to understand 'singularity'.

Q(10) With reference to Visible Light Communication (VLC) technology, which of the following statements are correct? (2020)

1. VLC uses electromagnetic spectrum wavelengths 375 to 780 nm.
2. VLC is known as long-range optical wireless communications.
3. VLC can transmit large amounts of data faster than Bluetooth.
4. VLC has no electromagnetic interference.

Select the correct answers using the code given below!—

- a) 1, 2 and 3 only
- b) 1, 2 and 4 only
- c) 1, 3 and 4 only
- d) 2, 3 and 4 only



Q(11) The term 'Axe-2' is talked about in the context of (2021)

- a) genes introduced in the genetically modified plants
- b) development of India's own satellite navigation system
- c) radio collars for wildlife tracking
- d) spread of viral diseases

Q(12) Which one of the following is the context in which the term 'qubit' is mentioned? (2022)

- a) Cloud Services
- b) Quantum Computing
- c) Visible Light Communication Technologies
- d) Wireless Communication Technologies

Q(13) Which one of the following countries has its own satellite navigation system? (2023)

- a) Australia
- b) Canada
- c) Israel
- d) Japan

Some Previous Years' Mains Questions (S&T)

Q(1) What do you understand by Fixed Drug Combinations (FDCs)? Discuss their merits and demerits. (200 words) [10 Marks] (2013)

Q(2) Scientific research in Indian universities is declining, because a career in science is not as attractive as are



business professions, engineering, or administration, and the universities are becoming consumer-oriented. Critically comment. (200 words) [12.5 Marks] (2014)

Q(3) What do you understand by 'Standard Positioning Systems' and 'Precision Positioning Systems' in the GPS era? Discuss the advantages India perceives from its ambitious IRNSS programme employing just seven satellites. (200 words) [12.5 Marks] (2015)

Q(4) Discuss India's achievements in the field of Space Science and Technology. How the application of this technology has helped India in its socio-economic development? (200 words) [12.5 Marks] (2016)

Q(5) Give an account of the growth and development of nuclear science and technology in India. What is the advantage of fast breeder reactor programme in India? (Answer in 250 words) [15 Marks] (2017)

Q(6) Discuss the work of 'Bose-Einstein Statistics' done by Prof. Satyendra Nath Bose and show how it revolutionized the field of Physics. (Answer in 150 words) [10 Marks] (2018)

Q(7) What is India's plan to have its own space station and



how will it benefit our space programme? (Answer in 150 words) [10 Marks] (2019)

Q8. What do you understand by nanotechnology and how it is helped in health sector? (Answer in 150 words) [10 Marks] (2020)

Q9. The Nobel Prize in Physics of 2014 was jointly to Akasaki, Amano and Nakamura for the invention of Blue LEDs in 1990s. How has this invention impacted the everyday life of human beings? (Answer in 250 words) [15 Marks] (2021)

Q10. Launched on 25th December, 2021, James Webb Space Telescope has been much in the news since then. What are its unique features which make it superior to its predecessor space telescopes? What are the key goals of this mission? What potential benefits does it hold for the human race? (Answer in 250 words) [15 Marks] (2022)

Q11. Introduce the concept of Artificial Intelligence (AI). How does AI help clinical diagnosis? Do you perceive any threat to privacy of the individual in the use of AI in healthcare? (Answer in 150 words) [10 Marks] (2023)