

UPSC MCQ's 2021

IAS Prelims MCQ's On Science & Technology

Science & Technology

1. Which of the following genetically modified (GM) crop/crops is/are legally allowed to be cultivated in India?

- i. GM Mustard
- ii. Bt Cotton
- iii. Bt Brinjal

Select the correct answer using the code given below.

- (a) ii only
- (b) ii and iii only
- (c) i and iii only
- (d) i, ii and iii

Ans: (a)

Explanation: Only Bt cotton has been legally allowed in India.

2. Which of the following pairs is/are correctly matched?

Space craft	Planet
i. Juno	Saturn
ii. Cassini	Jupiter
iii. Mangalyaan	Mars

- (a) i and ii only
- (b) iii only
- (c) i, ii and iii
- (d) None

Ans: (b)

Explanation: Both Juno and Cassini are the space mission of NASA to study on Jupiter and Saturn respectively, hence both i and ii pairs are wrong.

3. With reference to the Anti-microbial resistance, consider the following statements:

- i. Antimicrobial resistance, which is also referred to as drug resistance, results in formation of Super bugs.
- ii. It happens when microorganisms change when they are exposed to antimicrobial drugs used to treat the infections they cause.
- iii. India is home to several drug-resistant bugs which are spreading fast and have been noticed even in the operation theatres and intensive care units (ICUs) of several well-regarded hospitals.

Which of the above statements is/are correct?

- (a) i and ii only
- (b) ii and iii only
- (c) i and iii only
- (d) i, ii and iii

Ans: (d)

Explanation: All statements are correct.

4. With reference to 'Genetic Engineering Appraisal Committee (GEAC)', consider the following statements:

- i. It is established under the Ministry of agriculture.
- ii. It is the apex body for approval of activities involving large scale use of hazardous microorganisms and recombinants.
- iii. It is responsible for approval of proposals relating to release of genetically engineered organisms and products including experimental field trials.

Which of the statements given above is/are correct?

- (a) i only
- (b) ii and iii only
- (c) i and iii only
- (d) i, ii and iii

Ans: (b)

Explanation: Genetic Engineering Appraisal Committee (GEAC) established under the Environment (Protection) Act, 1986 comes under the Union Ministry of Environment, Forest and Climate Change (MoEFCC). It is the apex body to accord approval of activities involving large scale use of hazardous microorganisms and recombinants in research and industrial production from the environmental angle. The GEAC is also responsible for approval of proposals relating to release of genetically engineered organisms and products into the environment, including experimental field trials.

5. Which one of the following best describes 'Google Station', that was in news recently?

- a) It is a R&D project of Google with the mission of providing Internet access to rural and remote areas
- b) A public Wi-Fi platform
- c) A Wi-Fi speaker that can be stationed at your home or office to effortlessly manage every-day tasks
- d) 3D Mapping service

Ans: (b)

Explanation: Google plans to bring fast Public Wi-Fi service to cafes, malls and all other places with a new initiative called Google Station. The inspiration for Google Station came from the success of Google's partnership with Indian Railways to provide free Wi-Fi services at railway stations in India.

6. With reference to Agni-V Missile, which of the following statements is/are correct?

- i. It is India's first intercontinental ballistic missile.
- ii. It is a surface to surface, nuclear capable ballistic missile.
- iii. It can deliver one-tonne nuclear warheads about 15000 km away.

Select the correct answer using the code given below.

- (a) i only
- (b) ii and iii only
- (c) i and ii only
- (d) i, ii and iii

Ans: (c)

Explanation: Agni-V is India's first intercontinental ballistic missile and is a significant achievement by the Defence Research and development Organisation of India (DRDO). Agni V is a surface-to-surface nuclear capable ballistic missile. The missile carries the capacity to load a nuclear warhead weighing over a tonne. The missile can carry the warhead between the range of 5000-8000 kilometres.

7. What is "Perseverance" which was recently in the news?

- a) a satellite launched by ISRO to study about the Himalayas
- b) a next-generation meteorological satellite launched by JAXA
- c) space observatory launched by Japan
- d) A Mars Rover, part of NASA's Mars Exploration Programme

Ans: (d)

Explanation:

1. The NASA Perseverance Rover touched down on the surface of Mars in February 2021
2. Perseverance is a Mars rover that was launched in July 2020 from Cape Canaveral Space Force Station, Florida, USA
3. It is a part of the National Aeronautics and Space Administration's (NASA) Mars 2020 Mission
4. It is nicknamed 'Percy'

Some Facts

1. Perseverance is designed to better understand the geology of the red planet and seek signs of ancient life.
2. The rover landed on Mars in Jezero Crater on Feb. 18, 2021 seven months after its launch. The landing site within the crater has been named Octavia E. Butler Landing by NASA.

8. With reference to the Thirty Meter Telescope (TMT), which of the following statement/s is/are correct?

- i. It will help scientists detect black holes which may be residing in far-off galaxies.
- ii. A total of 8 organizations from different parts of the world are a part of the construction of the Thirty Meter Telescope.

Select the correct answer using the code given below.

- (a) i only
- (b) ii only
- (c) Both i and ii
- (d) Neither i nor ii

Ans: (c)

Explanation: The Thirty Meter Telescope is a new class of extremely large telescopes that will allow us to see deeper into space and observe cosmic objects with unprecedented sensitivity. Caltech, California Institute of Technology, India, China, Japan, Canada, California University, Gordon and Betty Moore Foundation, Association of Universities for Research in Astronomy (AURA) are part of its construction.

9. With reference to India's geographical information system 'Bhuvan', consider the following statements:

- i. Bhuvan offers detailed imagery of Indian locations with resolution of up to one meter.
- ii. It allows users to view 2D and 3D images along with information on terrain and water resources.
- iii. It acts as a platform for hosting government data and could be used a tool for urban design, contour mapping and mapping.

Which of the statements given above is/are correct?

- (a) i and iii only
- (b) ii only
- (c) i and ii only
- (d) i, ii and iii

Ans: (d)

Explanation: Bhuvan is India's Geospatial Information System platform developed by ISRO, which is widely used by Government, public, NGOs and Academia. Bhuvan offers detailed imagery of Indian locations with resolution up to one meter. It allows users to view 2D and 3D images along with information on terrain and water resources. It acts as a platform for hosting government data and could be used a tool for urban design, contour mapping and mapping. It is freely accessible on the internet; it caters to wide varieties of user communities and also supports disaster management.

10. What is/are the unique feature/s of 'BrahMos' cruise missile, a joint venture between India and Russia?

- i. BrahMos is a single-stage missile with only a solid propellant booster engine.
- ii. At present the missile has a flight range of 600 kilometers.

- iii. India and Russia started the development of BrahMos in 1998, which is based on the Russian Yakhont anti-ship missile.

Select the correct answer using the code given below.

- (a) i and ii only
- (b) iii only
- (c) i and iii only
- (d) i, ii and iii

Ans: (b)

Explanation: BrahMos is a two-stage cruise missile with a solid propellant booster engine as its first stage which brings it to supersonic speed and then gets separated. The liquid ramjet or the second stage the takes the missile closer to Mach 3 speed in cruise phase. The missile has flight range of up to 290 km with supersonic speed all through the flight, leading to shorter flight time, consequently ensuring lower dispersion of targets, quicker engagement time and non-interception by any known weapon system in the world. The BrahMos is a short-range ramjet supersonic cruise missile that can be launched from submarines, ships, aircraft or land. India and Russia have agreed to double the range of the BrahMos supersonic cruise missile to 600 kms. This follows India's recent accession to the Missile Technology Control Regime (MTCR). Earlier, India was denied access to missile technology with range over 300 km as it was not a member state.

11. With reference to 'Internet Corporation for Assigned Names and Numbers (ICANN)', recently in the news, which of the following statement is/are correct?

- i. ICANN is the United Nations specialized agency for information and communication technologies.
- ii. The ICANN sets and publishes regulations and standards relevant to electronic communication and broadcasting technologies of all kinds including radio, television, satellite, telephone and the Internet.

Select the correct answer using the code given below. \

- (a) i only
- (b) ii only
- (c) Both i and ii
- (d) Neither i nor ii

Ans: (d)

Explanation: ICANN is a nonprofit organization that has assumed the responsibility for IP address space allocation, protocol parameter assignment, domain name system management and root server system management functions previously performed under U.S. Government contract. It is not ICANN but The International Telecommunication Union (ITU) which is the United Nations specialized agency for information and communication technologies sets and publishes regulations and standards relevant to electronic communication and broadcasting technologies of all kinds including radio, television, satellite, telephone and the Internet.

12. With reference to the European Organization for Nuclear Research (CERN), which of the following statements is/are correct?

- i. At CERN, physicists and engineers are probing the fundamental structure of the universe.
- ii. The CERN laboratory sits astride the Austria-Germany border near Vienna.
- iii. India became an associate member of the CERN in 2016.

Select the correct answer using the code given below.

- (a) i only
- (b) ii and iii only
- (c) i and iii only
- (d) i, ii and iii

Ans: (c)

Explanation: CERN is the world's largest nuclear and particle physics laboratory and best known as operator of the Large Hadron Collider, which found the elusive Higgs boson in 2012. At CERN physicists and engineers are probing the fundamental structure of the universe. **It is based in Geneva on the French-Swiss border.** It has 22 member states and four associate member states and other associate members transitioning to full member status. India was inducted as an 'Observer' at CERN in 2004. India became an associate member of the CERN in 2016. The latest upgrade allows Indian companies to bid for lucrative engineering contracts and Indians can apply for staff positions at the organisation.

13. Amazonia-1 an earth observation satellite launched recently by India using PSLV-C51, will give information on

- (a) land and water bodies below
- (b) farm lands and crop extent
- (c) Remote sensing data to users for monitoring deforestation in the Amazon region and analysis of diversified agriculture across the Brazilian territory
- (d) All of the above

Ans: (c)

Explanation: Amazonia-1 was launched by PSLV-C51 in February 2021. It was launched from SHAR, Sriharikota. PSLV-C51/Amazonia-1 is the first dedicated commercial mission of NewSpace India Limited (NSIL), a Government of India company under Department of Space.

14. With reference to Nirbhay, which of the following statements is/are correct?

- i. It is a supersonic cruise missile.
- ii. It is a surface-to-surface missile.
- iii. The range of Nirbhay missile is more than 2000 km.

Select the correct answer using the code given below.

- (a) ii only

- (b) ii and iii only
- (c) i and iii only
- (d) i, ii and iii

Ans: (a)

Explanation: Nirbhay is a surface-to-surface, long-range subsonic cruise missile. It is a “tree-top” missile, which can fly at varying heights from five metres to five km. It is powered by a solid rocket motor booster, is guided by a highly advanced inertial navigation system. The missile, conceived, designed and developed by the DRDO, can take out targets 1,000 km away. It can carry a 300 kg warhead. It can carry multiple payloads and engage several targets. The missile can be fired from a variety of platforms such as a truck, a ship, an aircraft and underwater systems.

15. Which one of the following is the best description of ‘TaihuLight, which was in the news recently?’

- a) China’s first and only aircraft carrier, recently deployed to patrol the contested South China Sea.
- b) A cyber-espionage group that targets Indian government organisations and financial institutions.
- c) Hypersonic Weapon System used to strike time-sensitive targets such as weapons of mass destruction, recently developed by China.
- d) Chinese computer system which was recently named the world’s most powerful supercomputer.

Ans: (d)

Explanation: Sunway-TaihuLight is a supercomputer developed by the National Research Centre of Parallel Computer Engineering and Technology of China (NRCPC) built entirely using processors designed and made in China. It was declared the world’s fastest supercomputer, according to the November 2016 edition of the semi-annual Top 500 Supercomputer list.

16. With reference to ‘Hyperloop’, recently in the news, which of the following statements is/are correct?

- i. Hyperloop is a futuristic transportation concept that intends to transport people to their destinations at super speeds.
- ii. Frictional losses and high maintenance costs are the main impediments in implementing Hyperloop technology.

Select the correct answer using the code given below.

- (a) i only
- (b) ii only
- (c) Both i and ii
- (d) Neither i nor ii

Ans: (a)

Explanation: Hyperloop is a futuristic transportation concept that intends to transport people to their destinations at super speeds. Hyperloop is basically a capsule levitating inside a tube with minimal air to create a vacuum. Inside the tube, the capsule can move at a speed of more than 1000 kilometers per

hour. One of the biggest problems with anything moving, is friction, both against surfaces and the environment the pod is moving through. Hyperloop proposes to move away from traditional wheels by using air bearings for pods instead. This will have the pod floating on air. It's similar to maglev in which the electromagnetic levitation of the train means there is no friction like a traditional train that runs on tracks.

17. With reference to 'Internet of Things (IoT)', sometimes seen in the news, which of the following statements is/are correct?

- i. IoT generally refers to scenarios where network connectivity and computing capability extends to objects, sensors and everyday items.
- ii. IoT devices and services can serve as potential entry points for cyber-attack and expose user data to theft.
- iii. IoT amplifies concerns about the potential for increased surveillance and tracking.

Select the correct answer using the code given below.

- (a) i and ii only
- (b) ii and iii only
- (c) iii only
- (d) i, ii and iii

Ans: (d)

Explanation: The term Internet of Things generally refers to scenarios where network connectivity and computing capability extends to objects, sensors and everyday items not normally considered computers, allowing these devices to generate, exchange and consume data with minimal human intervention. Poorly secured IoT devices and services can serve as potential entry points for cyber-attack and expose user data to theft by leaving data streams inadequately protected. The Internet of Things is redefining the debate about privacy issues, as many implementations can dramatically change the ways personal data is collected, analysed, used, and protected. For example, IoT amplifies concerns about the potential for increased surveillance and tracking, difficulty in being able to opt out of certain data collection, and the strength of aggregating IoT data streams to paint detailed digital portraits of users.

18. With reference to 'Varuna 2021' consider the following statements:

- i. It is the joint military exercise between India and USA.
- ii. It is a joint military exercise between India and France.

Which of the statements given above is/are correct?

- (a) i only
- (b) ii only
- (c) Both i and ii
- (d) Neither i nor ii

Ans: (b)

Explanation: The 19th edition of the Indian and French Navy bilateral exercise 'Varuna-2021' took place in April 2021. It was a three-day exercise, to enhance their war fighting skills in order to demonstrate their ability as an integrated force to promote security, peace and stability in the maritime domain.

19. With reference to 'Falcon 9', consider the following statements:

- i. It is a three-stage rocket designed and manufactured by SpaceX.
- ii. It was designed from the outset to deliver humans into space.

Which of the statements given above is/are correct?

- (a) i only
- (b) ii only
- (c) Both i and ii
- (d) Neither i nor ii

Ans: (b)

Explanation: Falcon 9 is a two-stage rocket designed and manufactured by SpaceX for the reliable and safe transport of satellites and the Dragon spacecraft into orbit. Falcon 9 delivers payloads to space aboard the Dragon spacecraft or inside a composite fairing. Falcon 9 made history in 2012 when it delivered Dragon into the correct orbit for rendezvous with the International Space Station, making SpaceX the first commercial company ever to visit the station. Falcon 9, along with the Dragon spacecraft, was designed from the outset to deliver humans into space and under an agreement with NASA, SpaceX is actively working toward that goal.

20. With reference to 'India's Ballistic Missile Defence Shield (BMD)', consider the following statements:

- i. It is an indigenously developed interceptor missile system.
- ii. The BMD is being developed by the DRDO.

Which of the statements given above is/are correct?

- (a) i only
- (b) ii only
- (c) Both i and ii
- (d) Neither i nor ii

Ans: (c)

Explanation: India's Ballistic Missile Shield (BMD) is an indigenously developed interceptor missile. The BMD is being developed by the Defence Research and Development Organisation (DRDO) as a two layered system to tackle incoming targets at endo and exo atmospheres. Recently, the missile successfully destroyed an incoming ballistic missile in a direct hit, demonstrating the capability of India's Ballistic Missile Shield (BMD), which is under development.

21. With reference to 'Geosynchronous Satellite Launch Vehicle Mark III (GSLV Mk III)', which of the following statements is/are correct?

- i. It will be India's most powerful launch vehicle yet built.
- ii. It can lift satellites weighing 6 tonnes to space.
- iii. It is powered by cryogenic engines.

Select the correct answer using the code given below:

- (a) i only
- (b) ii and iii only
- (c) i and iii only
- (d) i, ii and iii

Ans: (c)

Explanation: The Geosynchronous Satellite Launch Vehicle Mark III is a launch vehicle developed by ISRO. GSLV Mk III will be India's most powerful launch vehicle yet built and it is powered by cryogenic engines. It can lift satellites weighing 4 tonnes to space; double the weight the current GSLV Mk II can lift. It will enable ISRO to launch communication spacecraft to geostationary orbits of 36000 km. Due to the absence of a powerful launcher; ISRO currently launches satellites above two tonne, on European rockets, for a big fee.

<https://www.isro.gov.in/launchers/gslv-mk-iii>

22. With reference to 'Navigation with Indian Constellation (NAVIC)', which of the following statements is/are correct?

- i. It is a system which will have eight satellites in orbit.
- ii. It will provide positioning information in the Indian region and 1500km around the mainland.
- iii. It will provide two levels of service; the standard positioning service for civilian use and a restricted service for defence use.

Select the correct answer using the code given below:

- (a) i only
- (b) ii and iii only
- (c) i and iii only
- (d) i, ii and iii

Ans: (b)

Explanation: The **Indian Regional Navigation Satellite System (IRNSS)** with an operational name of **NAVIC** (which also stands for **NAVigation with Indian Constellation**) is an autonomous regional satellite navigation system that is being set up by India, that will be used to provide accurate real-time positioning and timing services over India and the region extending to 1,500 kilometres around India. The NAVIC system will consist of a constellation of 3 satellites in Geostationary orbit (GEO), 4 satellites in Geosynchronous orbit. NAVIC will provide two levels of service, the standard positioning service will be

open for civilian use, and a restricted service (an encrypted one) for authorized users (including the military).

23. With reference to Coronary stents, consider the following statements

- i. Coronary stents are used for treating heart blocks.
- ii. Coronary stents are included in National List of Essential Medicines

Which of the statements given above is/are correct?

- (a) i only
- (b) ii only
- (c) Both i and ii
- (d) Neither i nor ii

Ans: (c)

Explanation: A coronary stent is a tube-shaped device placed in the coronary arteries that supply blood to the heart, to keep the arteries open in the treatment of coronary heart disease. It is used in a procedure called percutaneous coronary intervention (PCI). Recently, the National Pharmaceutical Pricing Authority (NPPA) on February 13 capped the price of coronary stents at a level up to 40 per cent lower than their existing market rates.

24. With reference to 'Coronavirus', which of the following statements is/are correct?

- i. A new strain of Coronavirus emerged in United Kingdom.
- ii. It was identified for the first time in Wuhan.
- iii. India reported its first case of the Wuhan Coronavirus on 30th Jan 2020

Select the correct answer using the code given below.

- (a) i only
- (b) ii and iii only
- (c) i and iii only
- (d) i, ii and iii

Ans: (d)

Explanation: Wuhan, the 7th-largest city in China, is the epicentre of a virus outbreak, the first few cases of which were reported in December 2019. According to some sources, the new variant originated in UK, could be about 70% more transmissible than the original strain. India reported its first case of the Wuhan Coronavirus on 30th Jan 2020. The patient is a female student of Wuhan University from Kerala.

25. With reference to 'Aquila', recently in the news, which of the following statement is/are correct?

- i. It is an initiative of Google launched in collaboration with Tata Trusts to educate women in rural India on the benefits of using the Internet.

- ii. Rather than use under-ground fibre optic cables or construct cell towers to connect users, it will use balloons that float in the stratosphere.

Select the correct answer using the code given below.

- (a) i only
- (b) ii only
- (c) Both i and ii
- (d) Neither i nor ii

Ans: (d)

Explanation: Aquila is the code name of the unmanned solar-powered drone developed by Facebook. The company plans to use a linked network of the drones to provide internet access to large rural areas. Recently Facebook completed the first successful flight of Aquila. However, as with its Internet.org project, Facebook will not be dealing with customers directly, instead it will be partnering with local ISPs to offer the services.

