Answers

1) C

Indian researchers have recently spotted an extremely bright, hydrogen deficient, fast-evolving supernova that shines with the energy borrowed from an exotic type of neutron star with an ultra-powerful magnetic field. Such type of supernovae called Super Luminous Supernova (SLSNe).

SN 2020ank, which was first discovered by the Zwicky Transient Facility on 2020, was studied by scientists from Aryabhatta Research Institute of Observational Sciences (ARIES) Nainital. The apparent look of the SN was very similar to other objects in the field. However, once the brightness was estimated, it turned out as a very blue object reflecting its brighter character.

Deep study of such ancient spatial objects can help probe the mysteries of the early universe.

Supernova (SNe): Supernovae are highly energetic explosions in the universe releasing an enormous amount of energy.

Super Luminous Supernova (SLSNe)

It is a type of stellar explosion with luminosity 10 or more times higher than that of standard supernovae. They occur very rare because they are generally originated from very massive stars (minimum mass limit is more than 25 times to that of the Sun), and the number distribution of such massive stars in our galaxy or in nearby galaxies is sparse.

Among them, SLSNe-I has been counted to about 150 entities spectroscopically confirmed so far. These ancient objects are among the least understood SNe because their underlying sources are unclear, and their extremely high peak luminosity is unexplained.

2) C

Scientists at the DBT-Institute of Life Sciences, Bhubaneswar and SRM-DBT Partnership Platform for Advanced Life Sciences Technologies, SRM Institute of Science and Technology, Tamil Nadu have reported for the first time a reference-grade whole genome sequence of Avicennia marina.

Avicennia Marina

It is one of the most prominent mangroves species found in all mangrove formations in India.

It is a salt-secreting and extraordinarily salt-tolerant mangrove species that grows optimally in 75% sea water and tolerates >250% seawater.

It is among the rare plant species, which can excrete 40% of the salt through the salt glands in the leaves, besides its extraordinary capacity to exclude salt entry to the roots.

Mangroves

- Mangroves are a unique group of species found in marshy intertidal estuarine regions and survive a high degree of salinity through several adaptive mechanisms.
- Mangroves are important resources for the coastal region and are of great ecological and economic value.
- They form a link between marine and terrestrial ecosystems, protect shorelines, provide habitat for a diverse array of terrestrial organisms.

3) A

International Chemical Conventions

The Chemical Weapons Convention (CWC) is an arms control treaty prohibiting the development, production, acquisition, stockpiling, retention, transfer or use of chemical weapons by States Parties. India is a signatory and party to the Convention.

The Minamata Convention on Mercury is a global treaty to protect human health and the environment from the adverse effects of mercury and its compounds.

The following conventions are ratified by India

- Stockholm Convention on Persistent Organic Pollutants (POPs): To protect human health and the environment from the harmful effects of POPs (i.e. toxic chemicals).
- Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.
- Basel Convention on the Control of Trans boundary Movements of Hazardous Wastes and their Disposal.

4) C

Himalayan Yak

It is a high-altitude bovine cousin of the cow grazes across the grasslands of the Tibetan Plateau. It is a long-haired bovine found throughout the Himalayan region of India.

It is found throughout the Himalayan region of the Indian subcontinent, the Tibetan Plateau, Northern Myanmar, Yunnan, Sichuan and as far north as Mongolia and Siberia. It is a "flagship species" and indicates the health of the ecosystem within which it lives.

5) D

Cauvery River

- It is one of the major rivers of the peninsular India.
- It rises at an elevation of 1,341 m at Talakaveri on the Brahmagiri range near Cherangala village of Kodagu district of Karnataka and drains into the Bay of Bengal.
- The total length of the river from origin to outfall is around 800 km.
- In size, it is smaller than the Godavari, the Mahanadi and the Krishna.
- Its important tributaries joining from left are the Harangi, the Hemavati, the Shimsha and the Arkavati whereas the Lakshmantirtha, the Kabbani, the Suvarnavati, the Bhavani, the Noyil and the Amaravati join from right.

6) C

International Financial Services Centers Authority (IFSCA) has recently issued a framework for Setting up and operating International Trade Finance Services Platform (ITFS).

International Trade Finance Services Platform (ITFS)

It refers to an electronic platform for facilitating the trade finance requirements of Exporters and Importers, through multiple Financiers.

It provides Trade Finance Services at International Financial Services Centers (IFSCs).

The framework will enable Exporters and Importers to avail various types of trade finance facilities at competitive terms, for their international trade transactions through a dedicated electronic platform viz, ITFS.

This will help in their ability to convert their trade receivables into liquid funds and to obtain short term funding. This framework will provide an opportunity to the participants to avail trade finance facilities for trade transactions such as Export Invoice Trade Financing, Reverse Trade Financing, Bill discounting under Letter of Credit, Supply Chain Finance for Exporters, Export Credit (Packing Credit), Insurance/ Credit Guarantee, Factoring and any other eligible product, on the ITFS platform.

International Financial Services Centers Authority (IFSCA)

It has been set up vide IFSCA Act, 2019 to develop and regulate the financial products, financial services and financial institutions in the International Financial Services Centres (IFSCs).

7) C

NASA's VIPER Mission

- NASA has announced that it will launch its Volatiles Investigating Polar Exploration Rover, or VIPER, in 2023.
- NASA is undertaking the mission to understand if it is possible for human life to sustain there, by using locally available resources.
- VIPER is a mobile robot, it is the first resource mapping mission on any other celestial body.
- VIPER's findings will inform "future landing sites under the Artemis program by helping to determine locations where water and other resources can be harvested" to sustain humans over extended stays.

8) A

Kesaria Buddha Stupa

The world-famous Kesaria Buddha stupa in located in east Champaran district of Bihar. The ASI (Archaeological Survey of India) has declared it a protected monument of national importance.

The stupa is said to be the tallest and the largest Buddhist stupa in the world. The first construction of the Stupa is dated to the 3rd century BCE.

The original Kesaria stupa probably dates to the time of Ashoka (circa 250 BCE), as the remains of a capital of a Pillar of Ashoka were discovered there. The current stupa dates to the Gupta Dynasty between 200 AD and 750 AD and may have been associated with the 4th century ruler Raja Chakravarti.

9) C

RBI Retail Direct Scheme

Recently, the Reserve Bank of India (RBI) had announced the 'RBI Retail Direct' scheme. It is a one-stop solution to facilitate investment in Government Securities by individual investors.

Retail investors (individuals) will have the facility to open and maintain the 'Retail Direct Gilt Account' (RDG Account) with RBI.

RDG Account can be opened through an 'Online portal' provided for the purpose of the scheme. The Non-Resident retail investors eligible to invest in Government Securities under Foreign Exchange Management Act, 1999 are eligible under the scheme.

The scheme allows that an investor would be able to bid in G-Secs auctions and buy them in the secondary market as well.

10) A

Arctic Amplification

Global warming and climate change are impacting the Arctic more than the rest of the world. A team of scientists have identified iodic acid (HIO_3) as a novel driver of new aerosol particle formation in the Arctic which is responsible for Arctic Amplification or Arctic Warming.

Presence of Iodic acid in the region had not been observed previously, these aerosol particles influence the formation of clouds. As these clouds reflect solar radiation (known as Aerosol Radiative Forcing) but also retain heat on the Earth's surface, they have an influence on the warming of the Arctic.

11) C

Carbon capture and Sequestration

Carbon capture and sequestration is the process of capturing waste carbon dioxide (CO_2) from large point sources, such as fossil fuel power plants, transporting it to a storage site, and depositing it where it will not enter the atmosphere, normally an underground geological formation. Carbon dioxide is naturally captured from the atmosphere through biological, chemical, and physical processes.

These changes can be accelerated through changes in land use and agricultural practices, such as converting crop and livestock grazing land into land for non-crop fast-growing plants.

There are different types of

- Biological Carbon Sequestration
- Geological Carbon Sequestration
- Industrial Carbon Sequestration
- Technological Carbon Sequestration

12) A

A British entrepreneur Richard Branson hurtled into space aboard his own winged rocket ship recently, beating out fellow billionaire Jeff Bezos. The nearly 71-year-old Branson and five crewmates from his Virgin Galactic space-tourism company reached an altitude of about 53 miles (88 kilometers) over the New Mexico desert enough to experience three to four minutes of weightlessness and see the curvature of the Earth and then safely glided to a runway landing.

But experts and space enthusiasts are in doubt whether the height to which he travelled can be termed 'space'.

Karman Line

- It is an attempt to define a boundary between Earth's atmosphere and outer space.
- The most widely accepted boundary of space is known as the Karman line, 100km above mean sea level.
- But the United States uses 80km as the cutoff point.
- The Karman line has been compared to international waters, as there are no national boundaries and human laws in force beyond the line.
- It was named after aerospace pioneer Theodore von Karman.
- But, various countries and entities define space boundary differently for various purposes.
- International law does not define the edge of space, or the limit of national airspace.
- Defining a legal boundary of what and where space is can help avoid disputes and keep track of space activities and human space travel.
- Some countries, including the United States, believe that defining or delimiting outer space is not necessary.

13) C

RBI has recently announced the 'RBI Retail Direct Scheme'.

RBI Retail Direct Scheme

It is a one-stop solution to facilitate investment in Government Securities (G-secs) by retail investors (individuals). Under the scheme, the investors will have the facility to open and maintain the 'Retail Direct Gilt Account' (RDG Account) with the RBI.

A "Gilt Account" means an account opened and maintained for holding Government securities. Instead of money, the account is debited or credited with treasury bills or government securities.

RDG account can be opened through an online portal provided for the purpose of the scheme. The online portal will give registered users access to primary issuance of G-secs and access to Negotiated Dealing System-Order Matching system (NDS-OM).

NDS-OM is an electronic, screen-based, anonymous, order-driven trading system for dealing in government securities. It was introduced by the RBI in 2005.

Retail Investor

They are non-professional investors who buy and sell securities or funds that contain a basket of securities such as mutual funds and exchange traded funds (ETFs). They execute their trades through traditional or online brokerage firms.

They purchase securities for their own personal accounts and often trade in dramatically smaller amounts as compared to institutional investors.

Institutional Investor

It is an umbrella term for larger-scale investments by professional portfolio and fund managers. They are the big players in the market who move big money.

Examples - Pension funds, Mutual funds, Money managers, Insurance companies, Investment banks, Commercial trusts, Endowment funds for a university or college, Hedge funds, Private equity firms or investors, etc

14) A

Legal Information Management & Briefing System (LIMBS)

- It is a web based portal developed by Department of Legal Affairs, Ministry of Law & Justice for monitoring and handling of various court cases of Govt. Departments and Ministries.
- It aims to create a National Portal of all cases pending in various courts/ Tribunals as a part of the e-Governance initiative.
- Tele-law service: It is aimed at facilitating delivery of legal advice through an expert panel of lawyers stationed at the State Legal Services Authorities (SLSA).

15) A

Union Education Minister Shri Dharmendra Pradhan and Tribal Affairs Minister Shri Arjun Munda will jointly launch the 'School Innovation Ambassador Training Program' for 50,000 School Teachers.

1. It aims at training 50,000 school teachers on Innovation, Entrepreneurship, IPR, Design Thinking, Product development, Idea generation etc.
2. The trained teachers will be designated as Innovation Ambassador of Ministry of Education.
3. They will nurture the young school students on Ideation, IPR, product development, design thinking, problem solving and critical thinking.
4. The program has been conceptualised by the Ministry of Education and All India Council for Technical Education (AICTE).
5. The program will be implemented by the Ministry of Education's Innovation Cell, AICTE and CBSE.

16) A

Rewilding of Wild Animals

- Under National Tiger Conservation Authority (NTCA) reintroduction of the cub into the wild after a certain time when it appears that the cub is capable of surviving in the wild independently and this is what is known as 'Re-wilding'.
- The NTCA stresses that the tiger cub should be reared in an in situ enclosure for a minimum of two years, and during this time, each cub should have a successful record of at least 50 'kills'.
- The process of re-wilding of a wild animal after rearing it in captivity is very complicated, and fraught with risks.
- There are 50-50 chances of success and failure of re-wilding of hand reared carnivores in the wild.
- The chance of success is less than 1 per cent if we look at all the failures of reintroductions and failures have led to deaths of many tigers as well as serious livestock depredations, and even man-eating problems.

17) C

Government of India has recently launched a digital platform Kisan Sarathi, to facilitate farmers to get right information at right time in their desired language.

The platform Kisan Sarathi was jointly launched by the Ministry of Agriculture and Farmers Welfare and Ministry of Electronics and Information Technology on the occasion of 93rd ICAR Foundation Day. This initiative will empower farmers with the technological interventions and reach farmers in remote areas.

18) C

Non-Fungible Tokens are creating a new idea of patronage and empowering everyone from musicians and artists to TikTok creators and meme makers.

Non-Fungible Tokens

- They are transaction records captured on the blockchain - the web version of a physical ledger.
- NFTs allow people to trade the ownership of digital entities such as memes, media, tweets, arts, articles in 'token' form.
- As NFTs are supported by blockchain, these transaction records are permanent, verified multiple times and cannot be erased or changed.
- It is not interchangeable in nature. It means that the NFT is not replaceable by another 'identical' item.
- In other words, each non-fungible token is uniquely identifiable. So, no two digital entities can have the same token.
- Rights - An NFT is a certificate of authenticity, or a digital autograph that can be attached to digital property.
- Buying an NFT doesn't convey copyright or usage rights unless there is an explicit licence mentioning it.
- Earning - NFTs don't offer any cash flow and are not real assets.
- The only way one can make money is by luring others into buying your NFT.
- To sell an NFT, a new NFT needs to be created by the seller.
- Creating an NFT will require spending real money which will go into the crypto economy.
- Importance - The Covid pandemic has further devastated the poorly-paid lives of innumerable artists, musicians and creators.
- The digital world offers a creative outlet, but in it, any creation can be easily duplicated.
- With NFTs, any creation can be tokenised to create a digital ownership certificate, helping creators get good price for their art.

19) B

A study has recently found that the caterpillar slug has now spread to several parts of India and predicted that it could soon become an invasive species attacking western and Peninsular India.

- Purcell's hunter slug or caterpillar slug
- The slug, Laevicaulis haroldi, is native to South Africa.
- It is listed as an endangered species and was first described in 1980.
- Not much is known about its ecology and according to studies, it entered India around 2010-2012 accidentally, through international trade via Mumbai.
- Now, there are over 60 records from all over the country.
- It has been reported to feed on the leaves and bark of mulberry plants.
- The slug was also sighted on neem trees, papaya, and calotropis plants.

20) B

Ultra Violet C Radiation

- The UV is divided into three bands: UV-C (100-280 nm), UV-B (280-315 nm) and UV-A (315-400 nm).
- The UV-A and UV-B rays from the Sun are transmitted through our atmosphere and all UV-C is filtered by the ozone layer.
- UV-C irradiation was highly effective in inactivating SARS-CoV-2 replication.
- Far-UVC light (207–222 nm) does not harm mammalian skin.
- The Far-UVC light has a very limited range and cannot penetrate through the outer dead-cell layer of human skin or the tear layer in the eye.