



Mock Questions Set- 4

(World Geography , Indian Geography, Environment and Science)

- 151.** Consider the following statements about Solid Fuel Ducted Ramjet (SFDR):
1. It has been developed by the Indian Space Research Organisation.
 2. The SFDR-based propulsion enables the missile to intercept aerial threats at short range at ultrasonic speeds.
- Select the correct answer using the codes given below:
- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2
- 152.** Consider the following statements with respect to BrahMos Supersonic Cruise Missile:
1. It is a two stage missile with solid propellant booster engine as its first stage and liquid ramjet as the second stage.
 2. It operates on 'Command Guidance'.
- Which of the above statements is/are not correct?
- (a) Only 1 (b) Only 2
(c) Both 1 and 2 (d) Neither 1 nor 2
- 153.** This River is a part of Godavari river basin and flows through Satpura and Ajanta ranges. It then flows through Satpura Plateau and plains of Vidarbha region and then finally merges with Godavari river at the border of Maharashtra and Telangana.
- The above description refers to which of the following rivers?
- (a) Manjra (b) Indravati
(c) Sabri (d) Pranhita
- 154.** Banni grasslands were in the news recently. They are located in:
- (a) Rajasthan (b) Gujarat
(c) Maharashtra (d) Haryana
- 155.** Consider the following pairs:
- | Missile | Type |
|------------|--------------------------------------|
| 1. Helina | – Anti-tank guided missile |
| 2. Astra | – Short range ballistic missile |
| 3. Prithvi | – Air to air missile |
| 4. Agni-5 | – Long range nuclear capable missile |
- Which of the pair(s) given above is/are correctly matched?
- (a) Only one pair.
(b) Only two pairs.
(c) Only three pairs.
(d) All four pairs.
- 156.** Consider the following statements about the coronal holes:
1. These are regions on the sun's surface from where fast solar wind gushes out into space.
 2. The coronal holes formation is a unique phenomenon which takes place frequently.
- Select the correct answer using the codes given below:
- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2
- 157.** Which of the following statements is not correct about tropical cyclones?
- (a) It has a low pressure centre.
(b) The weather is calm and free of clouds at the central part of the system.
(c) The wind blows clockwise in the Northern Hemisphere and counterclockwise in the Southern Hemisphere.
(d) They bring torrential rain and coastal flooding.
- 158.** Which pair of scientists was recently awarded the Nobel Prize in Physiology or Medicine 2024 for their groundbreaking research on microRNAs?
- (a) James Watson and Francis Crick
(b) Victor Ambros and Gary Ruvkun
(c) Andrew Fire and Craig Mello
(d) Rosalind Franklin and Barbara McClintock
- 159.** Which of the following statements is not correct about tigers in India?
- (a) The first assessment based on the scientific methodology of Indian tigers was done in 2006.
(b) The number of tigers has continuously increased in every survey since it started.
(c) The tiger census is carried out by National Tiger Conservation Authority.
(d) The tiger is classified as 'Vulnerable' in the IUCN's Red List of Threatened Species.
- 160.** Which of the following are the features of Green Energy Open Access?
1. The limit of Open Access Transaction has been reduced from 1 MW to 100 kW for green energy.
 2. Commercial and Industrial consumers are allowed to purchase green power on a voluntary basis.
 3. Green Ammonia has been included for the fulfillment of its Renewable Purchase Obligations.
- Select the correct answer using the codes given below:
- (a) 1 and 2 only (b) 2 and 3 only
(c) 1, 2 and 3 (d) 1 and 3 only

161. With reference to the Great Indian Bustards, consider the following statements:

1. These are the only species of Bustards found in India.
2. They prefer grasslands for their habitats.
3. They are herbivorous in nature.

Select the correct answer using the codes given below:

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

162. With reference to the Fibre Broadband, consider the following statements:

1. It is much faster and reliable than the conventional broadband services.
2. The fibre optics transmits light instead of electricity.
3. The method used for data transmission is through Digital Subscriber Line (DSL).

Select the correct answer using the codes given below:

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

163. Which of the following statements is not correct about Technology Innovation Hub on Autonomous Navigation (TIHAN)?

- (a) It is a multi-disciplinary initiative of Ministry of Science and Technology.
- (b) It will help in solving various challenges hindering the real-time adoption of unmanned autonomous vehicles for both terrestrial and aerial applications.
- (c) India has developed a testbed facility to evaluate the autonomous navigation of vehicles.
- (d) It will facilitate research grounds to investigate the functioning of unmanned and connected vehicles.

164. Consider the following places:

Places	State/U.T
1. Nathanmedu	Andhra Pradesh
2. Pangong Tso	Ladakh
3. Nadabet	Odisha
4. Mekedatu	Tamil Nadu

How many pair(s) given above is/are correctly matched?

- (a) Only one pair (b) Only two pairs
(c) Only three pairs (d) All four pairs

165. With reference to the Elephant Reserves in India, consider the following statements:

1. Project Elephant was launched in the year 1993 to protect elephants, their habitat and corridors.
2. Ministry of Environment, Forest and Climate Change provides the financial and technical support to major elephant range states in the country.
3. Kerala has the highest number of elephant reserves in India.

Select the correct answer using the codes given below:

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

166. The term "Polyfluoroalkyl substances" (PFAs) was often heard in news corresponds to:

- (a) It is naturally occurring substance used in production of paper.
- (b) Man-made chemicals used to make products that resist grease, water and oil.

- (c) Man-made substances used in construction of light-weight bricks.
- (d) Naturally occurring substance found in rocks, animals, plants, soil, and volcanic dust and gases.

167. With reference to the Large Hadron Collider, consider the following statements:

1. It is a complex machine built to study particles that are the smallest known building blocks of all things.
2. It uses a distribution system of liquid helium to keep its critical components ultracold at minus 271.3 degrees Celsius.
3. It has been developed by European Organisation for Nuclear Research.

Which of the statement(s) given above is/are correct?

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

168. This wetland lies downstream of Wular Lake with which it is connected, and forms an important site for biodiversity conservation. It lies on the Central Asian Flyway; over 40,000 migratory and resident bird species have been recorded annually. This wetland is located within the Jhelum River basin and plays a significant role in flood control, aquifer recharge, and regulating the water flow of Wular Lake.

The above-mentioned lines refer to which of the following wetland?

- (a) Hokera Wetland
- (b) Hygam Wetland
- (c) Surinsar-Manasar Wetland
- (d) Renuka Wetland

169. With reference to the hydrogen fuel cell, which of the following statement(s) is/are correct?

1. It uses only hydrogen to generate electricity and produces heat and water in the process.
2. It works in a similar manner to conventional batteries found in electric vehicles.

Select the correct answer using the code given below:

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

170. Which strait connects the Black Sea with the Sea of Marmara?

- (a) Bosphorus strait
- (b) North channel
- (c) Strait of Dover
- (d) Strait of Otranto

171. With reference to the Mangrove Alliance for Climate, consider the following statements:

1. India and UAE have launched it on the sidelines of the UN climate summit COP27.
2. The alliance aims to strengthen the conservation and restoration of mangrove ecosystems worldwide.

Which of the statement(s) given above is/are correct?

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

172. Consider the following statements about sickle cell anaemia:

1. It is an inherited genetic disease where a point mutation in haemoglobin makes it abnormal and prone to structural change.
2. It causes the white blood cells to take an abnormal sickle shape, which obstructs blood flow.
3. There is no complete cure for this disease.

Which of the statement(s) given above is/are correct?

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

173. "Yankti Kuti Valley" was recently in the news due to multiple events of glacial advances. It is located in:

- (a) Himachal Pradesh (b) Arunachal Pradesh
(c) Ladakh (d) Uttarakhand

174. Consider the following factors:

1. Earthquake
2. Soil erosion
3. Mining activities
4. Soil compaction

Which of the factors are responsible for land subsidence?

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

175. With reference to the semi-cryogenic engines in India, consider the following statements:

1. Liquid Propulsion Systems Centre of ISRO has undertaken the design and development of a semi cryogenic engine.
2. It is planned to validate the design of the propellant feed system.
3. It works on a Liquid-Oxygen-Hydrogen propellant combination.

How many of the above statements are correct?

- (a) Only one (b) Only two
(c) All three (d) None]

176. Consider the following pairs:

- | (Lake) | (Region) |
|-------------|---------------|
| 1. Titicaca | Africa |
| 2. Superior | North America |
| 3. Nakaru | South America |
| 4. Baikal | Europe |

How many of the above pairs are correctly matched?

- (a) Only one (b) Only two
(c) Only three (d) All four

177. Consider the following statements about hydrogen sulphide gas:

1. It is a toxic gas found in nature and industrial pollution.
2. Exposure to this gas leads to skin irritation and affects respiratory system.

Which of the above statement(s) is/are correct?

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

178. With reference to the sustainable aviation fuel, consider the following statements:

1. Sustainable aviation fuel is produced from sustainable feedstock derived from crude oil.
2. Sustainable aviation fuel has lower carbon footprint than aviation turbine fuel.

Which of the above statement(s) is/are correct?

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

179. Which of the following statements is not correct about thermobaric weapons?

- (a) It uses hydrogen from the air for a large, high-temperature blast.
- (b) It causes significantly greater devastation than a conventional bomb of comparable size.
- (c) It can be fired as rockets from tank-mounted launchers or dropped from aircraft.
- (d) These weapons are not prohibited by any international law or agreement.

180. Primovir, Paxista, Molnurat, and Molnatris were recently in the news. They are:

- (a) Generic COVID drugs
- (b) Non-communicable diseases
- (c) Unmanned Aerial Vehicle
- (d) Navigation satellites

181. With reference to the NVS-01 Mission, consider the following statements:

1. It was launched using a Polar Satellite Launch Vehicle.
2. It is the first of the second-generation satellites envisaged for the Navigation with Indian Constellation (NavIC) services.
3. It is equipped with an indigenous atomic clock.

How many of the above statements are correct?

- (a) Only one (b) Only two
(c) All three (d) None

182. Consider the following pairs:

- | (Place in News) | (Region) |
|----------------------|---------------------|
| 1. Yutucan Peninsula | Southeast Mexico |
| 2. Iberian Peninsula | Southwestern Europe |
| 3. Paracel Island | Indian Ocean |

How many of the above pairs are correctly matched?

- (a) Only one pair (b) Only two pairs
(c) All three pairs (d) None

183. With reference to the monkeypox, consider the following statements:

1. The monkeypox virus is an orthopoxvirus.
2. It causes symptoms similar to smallpox.
3. It is a disease that is transmitted from infected animals to humans.

How many of the above statements are correct?

- (a) Only one
(b) Only two
(c) All three
(d) None

184. Consider the following statements about transfats:

1. It can be of natural origin which is produced in the gut of ruminant animals and found in milk and meat.
2. They increase the tendency of blood to clot, through activation and aggregation of platelets.

Which of the above statement(s) is/are correct?

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

185. With reference to green hydrogen bunkering, consider the following statements:

1. India has set a deadline of 2030 to establish green hydrogen bunkering and refuelling facilities at major ports in the drive to cut its carbon footprint.
2. It will cover all the major ports of India.

Which of the statement(s) given above is/are correct?

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

186. "C40" was recently in the news. Which of the following is correct about C40?

- (a) Short-range air-to-air missile launched by Israel.
(b) It is a Spyware.
(c) Unmanned Aerial Vehicle (UAV) designed for high altitude.
(d) Network of global megacities.

187. Consider the following statements about Qubits:

1. It represents the information in the quantum form.
2. It can be either a 1 or 0.
3. It is hard to build and requires huge cryogenic refrigerators to operate correctly.

How many of the statements given above are correct?

- (a) Only one (b) Only two
(c) All three (d) None

188. Which of the following interlinking of the river will provide water to the drought-prone region of Bundelkhand?

- (a) Krishna-Godavari (b) Par-Tapi-Narmada
(c) Ken-Betwa (d) Mahanadi-Godavari

189. Consider the following:

1. Meteoroids
2. Dead satellite
3. Defunct spacecraft
4. Left over after the collision

How many of the above are included in space debris?

- (a) Only one (b) Only two
(c) Only three (d) All four

190. With reference to cloud seeding, consider the following statements:

1. It is a weather modification technology to create artificial rainfall.
2. It can work only if there are no pre-existing clouds in the atmosphere.
3. These 'seeds' of rain can be the iodides of silver or potassium or liquid propane.

How many of the statements given above are correct?

- (a) Only one
(b) Only two
(c) All three
(d) None

191. The MISHTI programme was launched by India on the World Environment Day to

- (a) Protect marine animals
(b) Increase the forest cover
(c) Protect olive ridley turtles
(d) Planting mangroves

192. With reference to Leptospirosis, consider the following statements:

1. It is a viral disease.
2. The common symptoms include fever, rash, body aches, and vomiting.
3. It cannot be treated.

How many of the statements given above are correct?

- (a) Only one (b) Only two
(c) All three (d) None

193. With reference to the GEMCOVAC-19, consider the following statements:

1. It is the indigenously developed first mRNA covid-19 vaccine.
2. It can be stored at the temperature of a standard medical refrigerator.
3. The technology uses genetically engineered mRNA to instruct cells to make the S-protein found on the surface of the Covid-19 virus.

How many of the statements given above are correct?

- (a) Only one (b) Only two
(c) All three (d) None

194. With reference to the short-lived Halogens, consider the following statements:

1. They have a lifetime of around two years in the atmosphere.
2. They are naturally produced by the oceans.
3. They cause depletion of ozone in the troposphere.

How many of the statements given above are correct?

- (a) Only one (b) Only two
(c) All three (d) None

195. India has signed the deal of "MH-60R helicopter" to boost the Indian Navy's efforts to expand its role in the Indian Ocean Region with:

- (a) Russia (b) Germany
(c) USA (d) France

196. With reference to the Large Hadron Collider (LHC), consider the following statements:

1. It is a complex machine built to study particles that are the smallest known building blocks of all things.
2. It has found the first evidence of the rare process by which the Higgs boson decays into a Z boson and a photon.
3. The LHC uses a distribution system of liquid Bromine to keep its critical components ultra cold at minus 271.3 degrees Celsius.

How many of the statements given above are correct?

- (a) Only one (b) Only two
(c) All three (d) None

197. Consider the following statements :

Statement-I : Sound is used by marine creatures to travel, obtain food, and protect themselves.

Statement-II : Although sound travels slower in water than in air, it is a significant medium of communication because it can transmit a large amount of information across vast distances.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement I and Statement II are correct and Statement II is the correct explanation for Statement I
- (b) Both Statement I and Statement II are correct and Statement II is not the correct explanation for Statement I
- (c) Statement I is correct but Statement II is incorrect
- (d) Statement I is incorrect but Statement II is correct

198. With reference to the lab-grown diamonds, consider the following statements:

1. They are produced using specific technology which mimics the geological processes that grow natural diamonds.
2. White Sapphire is used as a diamond simulant to look like a diamond.
3. The most common method to produce lab-grown diamonds is by use of the low-pressure, high-temperature method.

How many of the statements given above are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

199. With reference to Lithium-ion batteries, consider the following statements:

1. They use aqueous electrolyte solutions, where ions transfer to and from between the anode and cathode.
2. The energy density of lithium-ion batteries is nearly four times that of nickel-cadmium batteries.

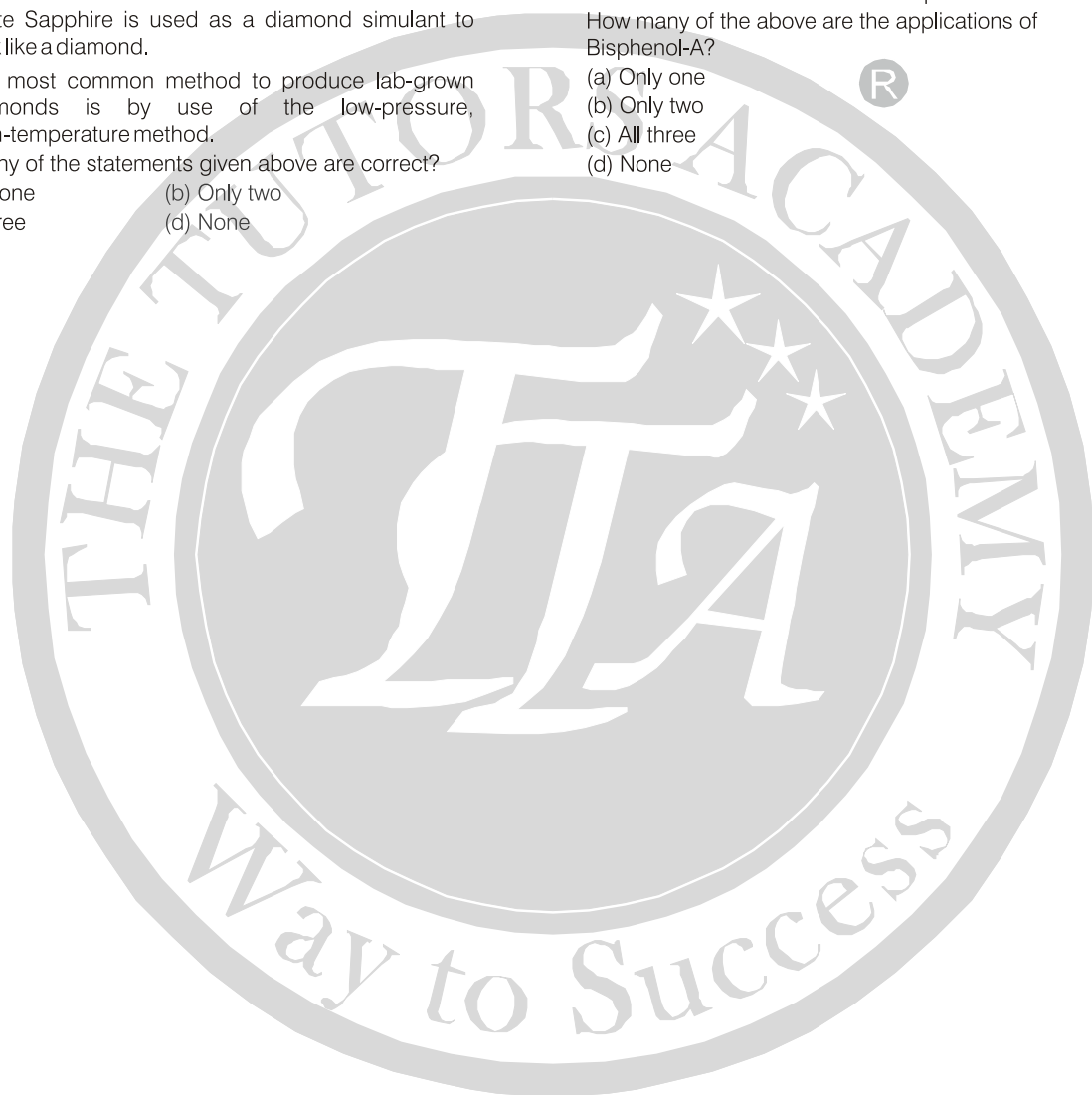
Which of the statement(s) given above is/are correct?

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

200. Consider the following applications:

1. Coating material for food and beverage.
 2. Cans in the packaging industry.
 3. Electronics and automobile components.
- How many of the above are the applications of Bisphenol-A?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None



Answers & Explanations

151. India has successfully tested Solid Fuel Ducted Ramjet (SFDR) booster, a missile system, at the Integrated Test Range (ITR) in Chandipur off the Odisha coast.

- ❑ The test demonstrated reliable functioning of all critical components involved in the complex missile system and met all the objectives of the mission.
- ❑ The SFDR-based propulsion enables the missile to intercept aerial threats at very long range at supersonic speeds. Hence, statement 2 is not correct.
- ❑ There are various measures to track the performance like telemetry, radar and electro optical tracking systems.
- ❑ The SFDR has been developed by Defence Research and Development Laboratory, Hyderabad, in collaboration with other DRDO laboratories such as Research Centre Imarat, Hyderabad and High Energy Materials Research Laboratory, Pune. Hence, statement 1 is not correct.

Therefore, option (d) is the correct answer.

152. Point to ponder: Supersonic Vs Ultrasonic

- ❑ BrahMos is a two-stage missile with a solid propellant booster engine as first stage which helps in attaining supersonic speed and then it gets separated. The second stage consists of liquid ramjet which takes the missile closer to the speed of 3 Mach.
- ❑ The missile has flight range up to 290-km with supersonic speed throughout the flight which results in lower dispersion of targets, quick time engagement and non-interception by any other weapon. It carries a conventional warhead of about 200-300 kgs.
- ❑ It operates on the 'Fire and Forget Principle'. Its destructive power is enhanced due to large kinetic energy on impact. Hence, statement 2 is incorrect.
- ❑ Features of BrahMos Missile
 - ❑ Universal for multiple platforms.
 - ❑ High supersonic speed throughout the flight.
 - ❑ Long flight range with varieties of flight trajectories.
 - ❑ Low radar signature.
 - ❑ Pinpoint accuracy with high lethal power.

Therefore, option (b) is the correct answer.

153. Pranrita river is part of Godavari river basin with a total catchment area of 1,10,000 Sq.Km.

- ❑ It flows through Satpura ranges and Ajantha ranges and further through Satpura Plateau and plains of Vidarbha region of Maharashtra before meeting Godavari river at Kaleshwaram on the Telangana – Maharashtra border.
- ❑ The Pranrita River System consists of mainly four major tributaries namely, Wainganga, Wardha, Penganga and Peddavagva.

Therefore, option (d) is the correct answer.

154. The Banni grasslands of Gujarat constitute about 4.33 per cent (8,490 sq km) of the total geographical area, distributed in eight districts and three different climatic regions, Kutch, Saurashtra and central Gujarat.

- ❑ A majority of grasslands in Gujarat (41 per cent) are found in the Kutch district. Banni grassland was declared a Protected Forest in 1955, under the Indian Forest Act, 1927
- ❑ Banni is also home to the Indian wolf, jackal, Indian fox, desert fox, desert cat, caracal, hyena, chinkara, Nilgai, wild boar, Indian hare, common monitor lizard, and the cheetah before it became extinct.

- ❑ The Gujarat forest department will restore 10,000 hectares of the Banni grasslands in the coming year, and every year in the coming decade.

Therefore, option (b) is the correct answer.

155.

Missile	Description
Helina	HELINA (Helicopter based NAG) is a third generation fire and forget class anti-tank guided missile (ATGM) system mounted on the Advanced Light Helicopter (ALH).
Astra	The Astra Mk-1 is a beyond visual range (BVR), air-to-air missile (AAM). The missile has been designed and developed by the Defence Research and Development Organisation (DRDO) for deployment on fighter jets like Sukhoi-30 MKI and Tejas of the IAF and the Mig-29K of the Navy. BVM missiles are capable of engaging beyond the range of 20 nautical miles or 37 kilometres
Prithvi	Prithvi is a short range ballistic missile. It was developed by Defence Research And Development Organisation (DRDO) under the Integrated Guided Missile Development Programme.
Agni – 5	Agni-5 is a long-range surface-to-surface nuclear capable ballistic missile which uses a three-stage solid-fuelled engine. The nuclear-capable missile has been developed by the Defence Research and Development organisation (DRDO). The development of Agni missiles started in early 1980 under the Integrated Guided Missile Development Programme spearheaded by scientist and former President Dr A P J Abdul Kalam, who was also a central figure in India's missile and space programmes.

- ❑ Therefore, option (b) is the correct answer.

156. Coronal holes are regions on the sun's surface from where fast solar wind gushes out into space. They contain little solar material, they have lower temperatures and thus appear much darker than their surroundings. Hence, statement 1 is correct.

- ❑ Coronal holes can last between a few weeks to months. The holes are not a unique phenomenon, they appear throughout the sun's approximately 11-year solar cycle. Hence, statement 2 is not correct.

Therefore, option (a) is the correct answer.

157. A tropical cyclone is a rapid rotating storm which originates over tropical oceans from where it draws the energy to develop.

- ❑ It has a low pressure centre and clouds spiral towards the eyewall surrounding the "eye", the central part of the system where the weather is normally calm and free of clouds.
- ❑ Its diameter is typically around 200 to 500 km, but can reach 1000 km.
- ❑ A tropical cyclone brings very violent winds, torrential rain, high waves and, in some cases, very destructive storm surges and coastal flooding.
- ❑ The winds blow counterclockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.

Therefore, option (c) is the correct answer.

- 158.** Victor Ambros and Gary Ruvkun have been recognized in the recent news for their pioneering contributions to our understanding of microRNAs, small RNA molecules that play a crucial role in regulating gene expression. Their work has significantly advanced the field of molecular biology, leading to their being honored with the Nobel Prize in Physiology or Medicine 2024. While other pairs in the options have made significant contributions in science—such as Watson and Crick for DNA structure, and Fire and Mello for RNA interference—the recent award specifically acknowledges the impactful research by Ambros and Ruvkun.

Therefore, option (b) is the correct answer.

- 159.** The number of tigers in India has increased by 6.74 per cent from 2,967 in 2018 to 3,167 in 2022, according to the figures of the 5th cycle of India's Tiger Census.

- ❑ — The Indian Prime Minister released the governments vision for tiger conservation during 'Amrit Kaal', and launched the International Big Cats Alliance (IBCA). IBCA will focus on the protection and conservation of seven major big cats of the world, including tiger, lion, leopard, snow leopard, puma, jaguar and cheetah, with the membership of the range countries harbouring these species.
- ❑ Project Tiger was launched by the Central government on April 1, 1973, in a bid to promote the conservation of the tiger.
- ❑ The programme came at a time when India's tiger population was rapidly dwindling. According to reports, while there were 40,000 tigers in the country at the time of the Independence, they were soon reduced to below 2,000 by 1970 due to their widespread hunting and poaching.
- ❑ The National Tiger Conservation Authority (NTCA) is a statutory body under the Ministry of Environment, Forests and Climate Change constituted under enabling provisions of the Wildlife (Protection) Act, 1972, as amended in 2006, for strengthening tiger conservation. It has been at the forefront of tiger conservation work in India.
- ❑ The tiger, *Panthera tigris*, is listed as 'Endangered' on the IUCN Red List of Threatened Species.

Therefore, option (d) is the correct answer.

- 160.** Ministry of Power has notified Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022 to further accelerate our ambitious renewable energy programmes, to ensure access to affordable, reliable, sustainable and green energy for all.

The salient features and benefits to common consumers from 'Green Energy Open Access' are as follows:

- (a) These rules are notified for promoting the generation, purchase and consumption of green energy including the energy from Waste-to-Energy plants.
- (b) Green Open Access is allowed to any consumer and the limit of Open Access Transaction has been reduced from 1 MW to 100 kW for green energy, enabling small consumers to purchase renewable power through open access. Hence, statement 1 is correct.
- (c) Consumers are entitled to demand supply of Green Power from Discoms. The Discoms would be obligated to procure and supply green power to eligible consumers.
- (d) Time-bound processing by bringing uniformity and transparency in the application and approval of open access through a national portal has been mandated.

- (e) Approval for Green Open Access is to be granted in 15 days or else it will be deemed to have been granted.
- (f) Commercial and Industrial consumers are allowed to purchase green power on a voluntary basis. Hence, statement 2 is correct.
- (g) There shall be a uniform Renewable Purchase Obligation (RPO), on all obligated entities in the area of a distribution licensee. Green Hydrogen/Green Ammonia has also been included to fulfil its RPO. Hence, statement 3 is correct.
- (h) Consumers will be given Green Certificates if they consume green power.

Therefore, option (c) is the correct answer.

- 161.** The Central government informed the Rajya Sabha that there was no great Indian Bustards (GIB) in Kutch Bustard Sanctuary (KBS) in Gujarat's Kutch district.

- ❑ GIBs are the largest among the four bustard species found in India, the other three being MacQueen's bustard, the lesser florican and the Bengal florican. Hence, statement 1 is not correct.
- ❑ GIBs' historic range included much of the Indian sub-continent but it has now shrunk to just 10 per cent of it.
- ❑ Among the heaviest birds with flight, GIBs prefer grasslands as their habitats. They spend most of their time on the ground with occasional flights to go from one part of their habitat to the other. Hence, statement 2 is correct.
- ❑ They feed on insects, lizards, grass, seeds, etc. Hence, statement 3 is not correct.
- ❑ GIBs are considered the flagship bird species of grassland and hence barometers of the health of grassland ecosystems.
- ❑ Scientists of the Wildlife Institute of India (WII) have pointed out overhead power transmission lines as the biggest threat to the GIBs.

Therefore, option (b) is the correct answer.

- 162.** Fiber broadband or fiber internet is an internet connection powered by fiber optics instead of more traditional methods of data transmission like cable or DSL (Digital Subscriber Line). Hence, statement 3 is not correct.

- ❑ Fiber broadband is considered much faster and more reliable than conventional broadband services and immune to interference. Hence, statement 1 is correct.
- ❑ Fiber broadband services often offer multiple broadband plans just like regular service providers and these will also usually be significantly more expensive.
- ❑ Fiber offers the fastest internet speeds, typically up to 1,000Mbps, compared to DSL and cable connections which usually offer up to 100Mbps and 400Mbps respectively.

Fiber Optics

- ❑ Fiber optics transmit light instead of electricity. These cables can carry data over really long distances, including across entire oceans, and still offer seamless connectivity with fast speeds due to a phenomenon called as total internal reflection. Hence, statement 2 is correct.
- ❑ These cables are made of a glass or plastic core, surrounded by a layer of cladding and protective sheaths. Both the core and cladding have high particular refractive indexes, with the cladding usually having a lower number than the core.

- ❑ This allows light passed through the optical fiber to be continuously reflected inside it and carried over long distances.
- ❑ They are placed at strategic intervals where the optic signal is losing strength but still can be read.
- ❑ These signals are then converted from optical to digital, and back to optical before they are pushed further on with full strength until the next repeater. This process continues till the optical signal reaches its target

Therefore, option (a) is the correct answer.

163. Technology Innovation Hub on Autonomous Navigation is a multidisciplinary initiative of the Ministry of Science and Technology, which aims at making India a global player in the futuristic and next-generation "Smart Mobility" technology.

- ❑ The multi-departmental initiative includes researchers from electrical, computer science, mechanical and aerospace, civil, mathematics, and design at IIT-Hyderabad.
- ❑ It will focus on solving various challenges hindering the real-time adoption of unmanned autonomous vehicles for both terrestrial and aerial applications.
- ❑ It will facilitate research grounds to investigate the functioning of unmanned and connected vehicles in a controlled environment by replicating different situations.
- ❑ It should be noted that there is no such testbed facility in India to evaluate the autonomous navigation of vehicles.
- ❑ It aims to fill this gap by developing a fully functional and exemplary testbed facility dedicated to connected autonomous vehicles (CAVs).

Therefore, option (c) is the correct answer.

164.

Place	State/U.T	Description
Nathanmedu	Tamil Nadu	The archeological site at Guruvan Medu, also known as Natham Medu, near Chennai, was originally discovered in 1922. Archeological Survey of India (ASI) has found hand axes, scrapers, cleavers and choppers as old as 12,000 years to rouletted ware (from the Sangam era – 2,000 years ago), Roman amphora sherds and glass beads indicating active trade with Rome.
Pangong Tso	Ladakh	pangong Tso is a 135-km-long landlocked lake. India has around 45 km of Pangong Tso under its control, while China has more than two-thirds. China is building a second bridge on the Pangong Tso lake, not far from the site of one of the most intense friction points in the border standoff that began in May 2020.
Nadabet	Gujarat	Nadabet is located in Rann of Kutch region which was inaugurated as an Indo-Pakistan border viewing point as a part of seema darshan project. It is also known as Wagah of Gujarat.

Mekedatu	Karnataka	The reservoir project at Makedatu was proposed by Karnataka. The project envisages a reservoir in Ramanagara district of south Karnataka at the confluence of the Cauvery and Arkavathi rivers. The project had created disputes between Tamil Nadu and Karnataka over the sharing of Cauvery water.
----------	-----------	--

Therefore, option (a) is the correct answer.

165. The Indian elephant occurs in the central and southern Western Ghats, North-east India, eastern India and northern India and in some parts of southern peninsular India. It occurs in 16 of the 28 states in the country.

- ❑ It is included in Schedule I of the Indian Wildlife (Protection) Act, 1972 and in Appendix I of the Convention on International Trade in Endangered Species of Flora and Fauna (CITES).
- ❑ Project Elephant was launched by the Government of India in the year 1992. Hence, statement 1 is not correct.
- ❑ The scheme was a Centrally Sponsored Scheme with following objectives:

- To protect elephants, their habitat & corridors
- To address issues of man-animal conflict
- Welfare of captive elephants

- ❑ The Ministry of Environment, Forest and Climate Change provides the financial and technical support to major elephant range states in the country through Project Elephant. Hence, statement 2 is correct.

Elephant Reserves in India (As on November, 2022)	
States	Elephant Reserves (ER)
Andhra Pradesh	Rayala
Arunachal Pradesh	Kameng, South Arunachal
Assam	Sonitpur, Dihing-Patkai, Kaziranga – Karbi Anglong, Dhansiri-Lungding and Chirang-Ripu
Chhattisgarh	Badakhol-Tamorpingla, Lemru
Jharkhand	Singbhum
Karnataka	Mysore, Dandeli
Kerala	Wayanad, Nilambur, Anamudi and Periyar
Meghalaya	Garohills
Nagaland	Intanki, Singphan
Odisha	Mayurbhanj, Mahanadi and Sambalpur
Tamil Nadu	Nilgiri, Coimbatore, Anamalai, Srivilliputtur and Agsthyamalai
Uttar Pradesh	Uttar Pradesh, Terai
Uttarakhand	Shivalik
West Bengal	Mayurbhanj, Eastern Doars

- ❑ Mysore Elephant Reserve in Karnataka is the largest while the Singphan Elephant Reserve in Nagaland is the smallest in India.
- ❑ Tamil Nadu and Assam have five reserve each, being the states with highest number of elephant reserves. Hence, statement 3 is not correct.

Therefore, option (c) is the correct answer.

- 166.** A recent study published in Environment Science and Technology has found that rainwater from many places across the globe is contaminated with "per- and polyfluoroalkyl substances," (PFAs), which are called "forever chemicals" because of their tendency to stick around in the atmosphere, rainwater and soil for long periods of time.
- ❑ According to the US Centre for Disease Control and Prevention (CDC), PFAs are man-made chemicals used to make nonstick cookware, water-repellent clothing, stain-resistant fabrics, cosmetics, firefighting forms and many other products that resist grease, water and oil.
 - ❑ PFAs can migrate to the soil, water and air during their production and use. Since most PFAs do not break down, they remain in the environment for long periods of time.
 - ❑ Some of these PFAs can build up in people and animals if they are repeatedly exposed to the chemicals.
 - ❑ The exposure of PFA can lead to decreased fertility, developmental effects in children, interference with body hormones, increased cholesterol levels and increased risk of some cancers.
 - ❑ There is no known method that can extract and remove PFAs from the atmosphere itself, there are many effective, albeit expensive, methods to remove them from rainwater that has been collected through various rainwater harvesting methods such as filtration system with activated carbon. The activated carbon will need to be removed and replaced regularly. Also, the old contaminated material must be destroyed.

Therefore, option (b) is the correct answer.

- 167.** The Large Hadron Collider is a giant, complex machine built to study particles that are the smallest known building blocks of all things. Hence, statement 1 is correct.
- ❑ It is structurally a 27-km-long track loop buried 100 metres underground on the Swiss-French border. It fires two beams of protons almost at the speed of light in opposite directions inside a ring of superconducting electromagnets.
 - ❑ The magnetic field created by the superconducting electromagnets keeps the protons in a tight beam and guides them along the way as they travel through beam pipes and finally collide.
 - ❑ Prior to the collision, another type of magnet is used to 'squeeze' the particles closer together to increase the chances of collisions.
 - ❑ The particles are so tiny that the task of making them collide is akin to firing two needles 10 km apart with such precision that they meet halfway," according to the European Organisation for Nuclear Research (Conseil Européen pour la Recherche Nucléaire, or CERN, in French), which runs the particle accelerator complex that houses the LHC. Hence, statement 3 is correct.
 - ❑ The LHC's powerful electromagnets carry almost as much current as a bolt of lightning, they must be kept chilled. The LHC uses a distribution system of liquid helium to keep its critical components ultracold at minus 271.3 degrees Celsius, which is colder than interstellar space. Given these requirements, it is not easy to warm

up or cool down the gigantic machine. Hence, statement 2 is correct.

Therefore, option (d) is the correct answer.

- 168.** India adds 11 more wetlands to the list of Ramsar sites to make total of 75 Ramsar sites covering an area of 13,26,677 ha in the country in the 75th year of Independence.
- ❑ The 11 new sites include four sites in Tamil Nadu, three in Odisha, two in Jammu and Kashmir and one each in Madhya Pradesh and Maharashtra.
 - ❑ The Hygam wetland lies downstream of another Ramsar Site, Wular Lake, with which it is connected, and forms an important site for biodiversity conservation.
 - ❑ It lies on the Central Asian Flyway; over 40,000 migratory and resident bird species have been recorded annually. The wetland also supports mammals, amphibians, and fish including the Eurasian otter (*Lutra lutra*), common carp (*Cyprinus carpio*) and common pochard (*Aythya ferina*).
 - ❑ The wetland is located within the Jhelum River basin and plays a significant role in flood control, aquifer recharge, and regulating the water flow of Wular Lake.
 - ❑ This wetland provides local communities with a range of "ecosystem services", providing fish, wood and clean water, and regulating the local climate.
 - ❑ However, it is increasingly threatened by continuous siltation, willow plantations and nutrient accumulation. To tackle these issues, the government of Jammu and Kashmir has been implementing an integrated management action plan since 2002.

Therefore, option (b) is the correct answer.

- 169.** A hydrogen fuel cell bus developed by KPIT-CSIR in Pune was unveiled by the Union Minister of State for Science and Technology.
- ❑ The hydrogen fuel cell uses hydrogen and air to generate electricity, producing only heat and water in the process. Hence, statement 1 is not correct.
 - ❑ According to the US Department of Energy, fuel cells work in a similar manner to conventional batteries found in electric vehicles but they do not run out of charge and don't need to be recharged with electricity. They continue to produce electricity as long as there is a hydrogen supply. Hence, statement 2 is correct.
 - ❑ Hydrogen is fed to the anode and air is fed to the cathode. At the anode, a catalyst separates the hydrogen molecules into protons and electrons and both subatomic particles take different paths to the cathode. The electrons go through an external circuit, creating a flow of electricity that can be used to power electric motors. The protons, on the other hand, move to the cathode through the electrolyte. Once there, they unite with oxygen and electrons to produce water and heat.
 - ❑ The primary advantage of hydrogen fuel cell electric vehicles (FCEV) is that they produce no tailpipe emissions. They only emit water vapour and warm air. Another advantage is that they are more efficient than internal combustion engine vehicles.

Therefore, option (b) is the correct answer.

- 170.** Turkey is set to implement an international convention on naval passage through two of its strategic straits, which would allow them to limit the movement of Russian warships between the Mediterranean Sea and the Black Sea.
- ❑ The Bosphorus and Dardanelles Straits, also known as the Turkish Straits or the Black Sea Straits, connect the Aegean Sea and the Black Sea via the Sea of Marmara.

It is the only passage through which the Black Sea ports can access the Mediterranean and beyond.

- ❑ According to the 1936 Montreux Convention Regarding the Regime of the Straits, often referred to simply as the Montreux Convention, Turkey has control over both the Bosphorus and Dardanelles straits.

Therefore, option (b) is the correct answer.

- 171.** It is an initiative led by the United Arab Emirates (UAE) and Indonesia, the Mangrove Alliance for Climate (MAC) includes India, Sri Lanka, Australia, Japan, and Spain. Hence, statement 1 is not correct.

- ❑ The alliance aims to strengthen the conservation and restoration of mangrove ecosystems worldwide. Hence, statement 2 is correct.
- ❑ Mangroves are natural armed forces of tropical and subtropical nations. They are the best option to fight against the consequences of climate change such as sea level rise and increasing frequency of natural calamities like cyclones and storm surges.
- ❑ Creating a new carbon sink from mangrove afforestation and reducing emissions from mangrove deforestation are two feasible ways for countries to meet their NDC targets and achieve carbon neutrality.

Therefore, option (b) is the correct answer.

- 172.** It is an inherited genetic disease where a point mutation in haemoglobin makes it abnormal and prone to structural change. Hence, statement 1 is correct.

- ❑ This causes the red blood cells to take an abnormal sickle shape, which obstructs blood flow. Hence, statement 2 is not correct.
- ❑ This can lead to severe haemolysis, persistent anaemia and affects the functioning of other organs in the later stages. Common symptoms are anaemia, jaundice, liver and spleen enlargement.
- ❑ In severe cases, patients have debilitating orthopaedic conditions called avascular necrosis of the femur. The disease can be very severe and reduces the quality of life.
- ❑ There is no complete cure. The only way we can help the patient is by providing symptomatic treatment and pain management. Improve nutritional status. There is a drug called Hydroxyurea that has been shown to reduce morbidity. Hence, statement 3 is correct.

Therefore, option (d) is the correct answer.

- 173.** The events of glacial advances have been witnessed from the Yankti Kuti valley in the extreme eastern part of Pithoragarh district, Uttarakhand.

- ❑ The strong tectonic activities that occurred several thousands of centuries ago along a major tributary of Kali Ganga river in the present-day Pithoragarh district of Uttarakhand could have led to an abrupt change in the glacial flow direction.
- ❑ Kuthi Yankti River is a major tributary of the Kali Ganga River.

Therefore, option (d) is the correct answer.

- 174.** Almost a week after cracks appeared in many roads and hundreds of houses of Joshimath, Uttarakhand, was declared as a landslide and subsidence hit zone. The announcement came after a high-level meeting took place among the senior officials of the Central government, Uttarakhand state officials, and top officers from agencies including the National Disaster Management Authority (NDMA), Geological Survey of India (GSI) and the National Institute of Hydrology (NIH).

- ❑ According to the National Oceanic and Atmospheric Administration (NOAA), subsidence is the "sinking of the ground because of underground material movement". It can happen for a host of reasons, man-made or natural, such as the removal of water, oil, or natural resources, along with mining activities.

- ❑ Earthquakes, soil erosion, and soil compaction are also some of the well-known causes of subsidence.

- ❑ The exact reason behind Joshimath land subsidence is still unknown but experts suggest that the incident might have occurred because of unplanned construction, over-population, obstruction of the natural flow of water and hydel power activities. Not only this, the area is a seismic zone, which makes it prone to frequent earthquakes.

Therefore, option (d) is the correct answer.

- 175.** ISRO carried out the first integrated test on an intermediate configuration of the 2000 kN semicryogenic engine at the newly commissioned Semicryogenic Integrated Engine and Stage Test facility at the ISRO Propulsion Complex (IPRC), Mahendragiri.

- ❑ The intermediate configuration, designated as Power Head Test Article (PHTA), comprises all the engine systems except the thrust chamber.
- ❑ The test is the first of a series of tests planned to validate the design of the propellant feed system, including the low-pressure and high-pressure turbo-pumps, the gas generator, and control components. Hence, statement 2 is correct.
- ❑ The Liquid Propulsion Systems Centre (LPSC) of ISRO has undertaken the design and development of a Semicryogenic engine with 2000 kN thrust with Indian industry participation, and will power the booster stages of future launch vehicles and works on Liquid Oxygen (LOX)-Kerosene propellant combination. Hence, statement 1 is correct and statement 3 is not correct.
- ❑ The newly established test facility at IPRC, Mahendragiri, with a state-of-art PLC-based control system and data acquisition system, is capable of testing semi-cryogenic engines up to 2600 kN thrust and will support the subsequent testing and qualification of the fully integrated Semicryogenic engine and stage.

Therefore, option (b) is the correct answer.

- 176.** According to new study published in journal Science, more than 50 per cent of the world's largest lakes and reservoirs have shrunk over the past three decades primarily due to climate change and human activities.

- ❑ It also noted that more than half of the reservoirs located in peninsular India have witnessed substantial water storage decline, mainly due to sedimentation. Moreover, among the worst affected natural lakes in the country is Ladakh's Tso Moriri.
- ❑ A team of international researchers reported that some of the world's most important water sources – from the Caspian Sea between Europe and Asia to South America's Lake Titicaca – lost water at a cumulative rate of around 22 gigatonnes per year for nearly three decades.

Lake	Region
Titicaca	South America (Peru and Bolivia)
Superior	North America (US and Canada)

Nakuru	Africa (Kenya)
Baikal	Asia (Russia)

Therefore, option (a) is the correct answer.

- 177.** A recent incident of toxic gas leakage, suspected to be Hydrogen Sulphide, in Ludhiana Giaspura which led to the death of 11 people, and the hospitalisation of many others.

- ❑ Hydrogen sulphide is a toxic gas found in nature, swamps, and during industrial production. Hence, statement 1 is correct.
- ❑ It is interesting to note that the human body also produces enzymatic or non-enzymatic methods of very small quantities of hydrogen sulphide.
- ❑ Any exposure to hydrogen sulphide in the atmosphere can lead to irritation and skin reaction, and if inhaled in larger quantities, it can stop cellular respiration. Hence, statement 2 is correct.
- ❑ Hydrogen sulphide, which is an extremely pungent gas can also lead to "premature asthma attacks."
- ❑ Long-term exposure to hydrogen sulphide can lead to more serious health problems, such as damage to the nervous system and lungs.

Therefore, option (c) is the correct answer.

- 178.** According to Union Petroleum Ministry, India is well-positioned to achieve 1 per cent sustainable aviation fuel (SAF) blending in aviation turbine fuel (ATF) for all commercial flights by 2025.

- ❑ SAF is produced from sustainable feedstock and has similar chemistry to conventional ATF or jet fuel, which is derived from crude oil. Hence, statement 1 is correct.
- ❑ SAF's carbon footprint is significantly lower than ATF. Hence, statement 2 is correct.
- ❑ A committee on SAF constituted by the petroleum ministry has submitted its recommendations to the government. According to people with direct knowledge of the matter, the panel has recommended an initial SAF blending mandate of 1 per cent from 2025, before scaling it up to 10 per cent over subsequent years in phases.

Therefore, option (c) is the correct answer.

- 179.** Human rights groups Amnesty International and Human Rights Watch, and Ukraine's ambassador to the United States Oksana Markarova accused Russia of using cluster bombs and vacuum bombs in the ongoing war.

- ❑ Thermobaric weapons — also known as aerosol bombs, fuel air explosives, or vacuum bombs — use oxygen from the air for a large, high-temperature blast.
- ❑ A thermobaric weapon causes significantly greater devastation than a conventional bomb of comparable size.
- ❑ The weapons, which go off in two separate stages, can be fired as rockets from tank-mounted launchers or dropped from aircraft.
- ❑ Vacuum bombs are not prohibited by any international law or agreement, but their use against civilian populations in built-up areas, schools or hospitals, could attract action under the Hague Conventions of 1899 and 1907.
- ❑ Countries that have ratified the Convention on Cluster Munitions are prohibited from using cluster bombs. As of date, there are 110 state parties to the convention, and 13 other countries have signed up but are yet to ratify it. Neither Russia nor Ukraine are signatories.

Therefore, option (a) is the correct answer.

- 180.** The demand for Indian generic drugs has shot up in China amid the massive COVID surge in the country, with Chinese experts cautioning that fake versions of these drugs are flooding the market.

- ❑ Due to the massive short supply of Paxlovid, demand for Indian generic versions has gone up through Chinese e-commerce platforms.
- ❑ Four generic COVID drugs produced in India — Primovir, Paxista, Molnuat, and Molnatris — have been listed for sale in recent weeks. Primovir and Paxista are both generic versions of Paxlovid, while the other two are generic versions of Molnupiravir.
- ❑ All four drugs appear to have been approved for emergency use by the Indian authorities but are not legal for use in China.

Therefore, option (a) is the correct answer.

- 181.** The Indian Space Research Organisation successfully launched the first of the five second-generation satellites for the Navigation by Indian Constellation (NavIC). Hence, statement 2 is correct.

- ❑ The 2,232 kg satellite, launched using a Geosynchronous Satellite Launch Vehicle or GSLV rocket, will add to India's regional navigation system and provide accurate and real-time navigation. Hence, statement 1 is not correct.
- ❑ The satellite took off from the second launch pad at 10.42 am aboard GSLV-F12 and was inserted just over 18 minutes later into a geosynchronous transfer orbit of 173 km * 40,700 km that will be circularised over the next couple of days to bring the satellite to its final position.
- ❑ NVS-01 is the first of the second-generation satellites envisaged for the Navigation with Indian Constellation (NavIC) services.
- ❑ NVS series of satellites will sustain and augment the NavIC with enhanced features.
- ❑ This series incorporates L1 band signals additionally to widen the services. For the first time, an indigenous atomic clock will be flown in NVS-01. Hence, statement 3 is correct.

Therefore, option (b) is the correct answer.

182.

Place in News	Region
Yutucan Peninsula	Southeast Mexico
Iberian Peninsula	Southwestern Europe
Paracel Island	South-China Sea

Therefore, option (b) is the correct answer.

- 183.** The monkeypox virus is an orthopoxvirus, which is a genus of viruses that also includes the variola virus, which causes smallpox, and vaccinia virus, which was used in the smallpox vaccine. Hence, statement 1 is correct.

- ❑ Monkeypox causes symptoms similar to smallpox, although they are less severe. Hence, statement 2 is correct.
- ❑ Vaccination eradicated smallpox worldwide in 1980, monkeypox continues to occur in a swathe of countries in Central and West Africa, and has on occasion showed up elsewhere.

- ❑ According to the World Health Organisation (WHO), two distinct clade are identified: the West African clade and the Congo Basin clade, also known as the Central African clade.
- ❑ Monkeypox is a zoonosis, that is, a disease that is transmitted from infected animals to humans. According to the WHO, cases occur close to tropical rainforests inhabited by animals that carry the virus. Monkeypox virus infection has been detected in squirrels, Gambian poached rats, dormice, and some species of monkeys. Hence, statement 3 is correct.

Therefore, option (c) is the correct answer.

- 184.** Trans fats can be of natural origin, produced in the gut of ruminant animals and found in milk and meat sourced from them. Hence, statement 1 is correct.

- ❑ The trans-fats in human diet are now mostly derived from industrial processes, which partially hydrogenate liquid vegetable oils to make them more solid.
- ❑ Effects of Trans fats
- ❑ The fraction of blood cholesterol that protects blood vessels (HDL cholesterol) is decreased.
- ❑ They increase the tendency of blood to clot, through activation and aggregation of platelets. Hence, statement 2 is correct.
- ❑ They inflame the inner lining of blood vessels.
- ❑ There is also an enhanced risk of developing Type 2 diabetes.
- ❑ Involvement of the coronary arteries leads to heart attacks. Similarly, there is an increased risk of stroke and paralysis when blood vessels supplying blood to the brain are affected.
- ❑ The World Health Organisation (WHO) estimates that 50,00,000 lives are lost due to premature deaths from coronary heart disease which are attributable to consumption of trans-fats.

Therefore, option (c) is the correct answer.

- 185.** According to the guidelines released by the Ministry of Shipping, India has set a deadline of 2035 to establish green hydrogen and refuelling facilities at major ports in the drive to cut its carbon footprint. Hence, statement 1 is not correct.

- ❑ The target is to cover all 12 major ports with a green hydrogen bunkering facility by 2035. The initial ports in the effort are to be Paradip in the east, Kandla in the west, and Tuticorin in the south. Hence, statement 2 is correct.
- ❑ More than 200 ports dot India's coastline, which stretches 7,500 km (4,660 miles), in addition to the 12 major ones, altogether accounting for 95 per cent of its trade by volume and 65 per cent by value.
- ❑ One of the world's biggest emitters of greenhouse gases, India aims to cut emissions to net zero by 2070 and to meet the net-zero goal, at least 40 per cent of India's electricity will have to come from renewables.

Therefore, option (b) is the correct answer.

- 186.** C40 is a network of 97 global megacities that have come together to confront the climate crisis.

- ❑ It is a network driven by the cities, for the cities and it is led by the cities. These 97 cities are members and our chair is on a rotational basis. The mayor of one of the member cities becomes the chair.
- ❑ Cities are the centre of climate change and climate action. They are the epicentre of bringing people together for economic opportunities or livelihood and

they also end up being the largest emitters of greenhouse gas emissions.

Therefore, option (d) is the correct answer.

- 187.** International Business Machines (IBM)) has designed a new quantum computing chip, "Eagle" has 127 so-called "qubits," which can represent information in quantum form. Hence, statement 1 is correct.

- ❑ The classical computers work using "bits" that must be either a 1 or 0, but qubits can be both a 1 and a 0 simultaneously. Quantum computers are much faster than classical computers. Hence, statement 2 is not correct.
- ❑ The qubits are exceedingly hard to build and require huge cryogenic refrigerators to operate correctly. Hence, statement 3 is correct.

Therefore, option (b) is the correct answer.

- 188.** The Ken-Betwa link project is the first project under the National Perspective Plan for the interlinking of rivers.

- ❑ It envisages transferring water from the Ken River to the Betwa River, both tributaries of the Yamuna.
- ❑ The Ken-Betwa Link Canal will be 221 km long, including a 2 km long tunnel.
- ❑ The project will cover Bundelkhand a drought-prone region, which spreads across 13 districts of Uttar Pradesh and Madhya Pradesh.
- ❑ The project has two phases, with mainly four components.

Phase-I will involve one of the components — the Daudhan Dam complex and its subsidiary units such as Low-Level Tunnel, High-Level Tunnel, Ken-Betwa Link Canal and powerhouses.

Phase II will involve three components — Lower Orr Dam, Bina Complex Project and Kotha Barrage.

According to the Jal Shakti Ministry, the project is expected to provide annual irrigation of 10.62 lakh hectares, supply drinking water to about 62 lakh people, and generate 103 MW of hydropower and 27 MW of solar power.

If you know where the rivers flow, you know your answer!

Therefore, option (c) is the correct answer.

- 189.** Space debris can include natural space debris such as meteoroids, or man-made ones which can include defunct spacecrafts and satellites, stages of rockets which have launched payloads, dead satellites, satellite explosions and collisions.

- ❑ According to NASA, "more than 25,000 objects larger than 10 cm are known to exist" as space debris and the estimated population of particles between 1 and 10 cm in diameter is approximately 500,000.
- ❑ According to NASA's estimates, as of January 2022, the amount of material orbiting the Earth exceeded 9,000 metric tons.

Therefore, option (d) is the correct answer.

- 190.** cloud seeding is a weather modification technology to create artificial rainfall. Hence, statement 1 is correct.

- ❑ It works only when there are enough pre-existing clouds in the atmosphere. Hence, statement 2 is not correct.
- ❑ Rain happens when moisture in the air reaches levels at which it can no longer be held, and cloud seeding aims to facilitate and accelerate that process by making available chemical 'nuclei' around which condensation can take place.

- ❑ These 'seeds' of rain can be the iodides of silver or potassium, dry ice (solid carbon dioxide), or liquid propane. Hence, statement 3 is correct.
- ❑ The seeds can be delivered by plane or sprayed from the ground.

Therefore, option (b) is the correct answer.

191. Prime Minister Narendra Modi launched the Union government's Mangrove Initiative for Shoreline Habitats and Tangible incomes (MISHTI) programme on World Environment Day on June 5.

- ❑ MISHTI aims at planting mangroves in 540 sq km on the coastline, spanning 11 states and two Union territories.
- ❑ "Under the MISHTI project, work is underway to increase mangroves cover along the coast.
- ❑ This programme to plant mangroves started in Dwarka on around 3,000 hectares through initiatives under Compensatory Afforestation Fund Management and Planning Authority, Mahatma Gandhi National Rural Employment Guarantee Act and public-private partnership.

Therefore, option (d) is the correct answer.

192. Leptospirosis is a bacterial disease usually affects animals and can spread to human beings if they are travelling through waterlogged areas. Hence, statement 1 is not correct.

- ❑ Leptospira is a bacteria which is present in the excreta and urine of animals can infect human beings if they are exposed to it – they can be exposed if they are wading through contaminated water, if there is a cut in the skin which has been exposed to the bacteria.
- ❑ The common symptoms of leptospirosis include fever, rash, body ache, and vomiting. Hence, statement 2 is correct.
- ❑ If leptospirosis is left untreated, it can cause kidney damage and even prove to be fatal. This can be treated with antibiotics. Hence, statement 3 is not correct.

Therefore, option (a) is the correct answer.

193. The country's first home-grown mRNA Covid-19 vaccine — GEM COVAC-19 — developed at pUNE's Gennova Biopharmaceuticals has got a 'restricted emergency use' nod for the 18-and-above age group. Hence, statement 1 is correct.

- ❑ As mRNA vaccines are required to be kept at sub-zero temperatures, it was a mammoth task for Gennova scientists to develop a thermostable mRNA Covid-19 vaccine.
- ❑ Scientists had to innovate to suit local needs to make it affordable and deployable. The new vaccine can now be stored at the temperature of a standard medical refrigerator. Hence, statement 2 is correct.
- ❑ Basically, the technology uses genetically engineered mRNA to instruct cells to make the S-protein found on the surface of the Covid-19 virus. Hence, statement 3 is correct.

Therefore, option (c) is the correct answer.

194. According to a new study published in Nature, Oceans help absorb carbon dioxide and moderate the climate as they also cool the planet by releasing short-lived halogens such as chlorine, bromine and iodine.

- ❑ Short-lived halogens have a lifetime of less than six months in the atmosphere. Hence, statement 1 is not correct.
- ❑ They are naturally produced by the oceans. Hence, statement 2 is correct.

- ❑ Human activities cause pollutants such as ozone to deposit in the ocean, which then converts the soluble short-lived halogens into insoluble ones, forcing them out of the seawater and into the atmosphere.
- ❑ Halogens cause a depletion of ozone in the troposphere. Hence, statement 3 is correct.

Therefore, option (b) is the correct answer.

195. The 24 multi-role MH-60 romeo helicopters are expected to boost the Indian Navy's efforts to expand its role in the Indian Ocean Region.

- ❑ The MH-60 Romeo Seahawk, made by defence giant Lockheed Martin, is one of the most advanced naval helicopters in the world, used by the US Navy among others. It will be purchased directly from the US government under a Foreign Military Sales (FMS) agreement with the US Department of Defence (DoD).
- ❑ It is the most capable and mature Anti-Submarine Warfare (ASW) Anti-Surface Warfare (ASuW) multi-mission helicopter available in the world today.
- ❑ The MH-60 is designed to hunt down submarines and will add to the strategic depth and combat capability of the Indian Navy.
- ❑ It is capable of launching Hellfire missiles from the right and left extended pylons.
- ❑ It also has an advanced system for passive detection, location, and identification of emitters. It can not only track and hunt ships but is also used by the US Navy as an anti-submarine weapon.

Therefore, option (c) is the correct answer.

196. The European Organization for Nuclear Research (CERN), which hosts the Large Hadron Collider (LHC) said that scientists at the organisation found the first evidence of the rare process by which the Higgs boson decays into a Z boson and a photon. Hence, statement 2 is correct.

- ❑ The Large Hadron Collider is a giant, complex machine built to study particles that are the smallest known building blocks of all things. Hence, statement 1 is correct.
- ❑ It has a 27-km-long track loop buried 100 metres underground on the Swiss-French border. In its operational state, it fires two beams of protons almost at the speed of light in opposite directions inside a ring of superconducting electromagnets.
- ❑ The magnetic field created by the superconducting electromagnets keeps the protons in a tight beam and guides them along the way as they travel through beam pipes and finally collide.
- ❑ The LHC uses a distribution system of liquid helium to keep its critical components ultracold at minus 271.3 degrees Celsius, which is colder than interstellar space. Hence, statement 3 is not correct.

Therefore, option (b) is the correct answer.

197. A new study has found that noise generated by human activity makes it harder for dolphins to communicate and coordinate with each other.

- ❑ Marine animals are known to use sound to navigate, find food and protect themselves. Hence, statement 1 is correct.
- ❑ As sound travels faster in water than air, it makes for an important mode of communication because it can convey a lot of information quickly and over long distances. Hence, statement 2 is not correct.

- ❑ Scientists believe that fish species rely on sounds during reproductive activities, including mate attraction, courtship and mate choice.

Therefore, option (c) is the correct answer.

198. Lab-grown diamonds are diamonds that are produced using specific technology which mimics the geological processes that grow natural diamonds. Hence, statement 1 is correct.

- ❑ They are not the same as “diamond simulants” – LGDs are chemically, physically and optically diamond and thus are difficult to identify as lab-grown.
- ❑ The materials such as Moissanite, Cubic Zirconia (CZ), White Sapphire, YAG, etc. are “diamond simulants” that simply attempt to “look” like a diamond, they lack the sparkle and durability of a diamond and are thus easily identifiable. Hence, statement 2 is correct.
- ❑ There are multiple ways in which LGDs can be produced. The most common (and cheapest) is the “High pressure, high temperature” (HPHT) method. As the name suggests, this method requires extremely heavy presses that can produce up to 730,000 psi of pressure under extremely high temperatures (at least 1500 celsius). Hence, statement 3 is not correct.
- ❑ Usually, graphite is used as the “diamond seed” and when subjected to these extreme conditions, the relatively inexpensive form of carbon turns into one of the most expensive carbon forms.

Therefore, option (b) is the correct answer.

199. The energy density of lithium-ion cells used in today's mobile phones and electric vehicles is nearly four times higher than that of older-generation nickel-cadmium batteries. Hence, statement 2 is correct.

- ❑ Lithium-ion batteries use aqueous electrolyte solutions, where ions transfer to and fro between the anode (negative electrode generally made of graphite) and cathode (positive electrode made of lithium), triggering the recharge and discharge of electrons. Hence, statement 1 is correct.

- ❑ The lithium-ion batteries are seen as sufficiently efficient for phones and laptops, they still lack the range that would make EVs a viable alternative to internal combustion engines.

- ❑ One major problem is that lithium metal is extremely reactive. The main form of lithium corrosion are dendrites, which are branched lithium structures that grow out from the electrode and can potentially pierce through the separator and on to the other end, short-circuiting the cell.

Therefore, option (c) is the correct answer.

200. The CSIR-National Chemical Laboratory (NCL) in Pune has successfully demonstrated the operations of a pilot plant capable of manufacturing Bisphenol-A, a key raw material with high demand for manufacturing engineering plastics globally.

- ❑ The material has wide-scale applications as coating material for food and beverage cans in the packaging industry, in electronics and automobile components, and for the overall manufacture of engineering plastics.
- ❑ However, higher traces of Bisphenol-A have been found in milk bottles for babies and cases of it leaching through food cans have also been reported.

Therefore, option (c) is the correct answer.