

VISIONIAS

www.visionias.in

Test Booklet Series

TEST BOOKLET

C

GENERAL STUDIES (P) 2026 – Test – 6328

Time Allowed: Two Hours

Maximum Marks: 200

INSTRUCTIONS

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS BOOKLET DOES **NOT** HAVE ANY UNPRINTED OR TURN OR MISSING PAGES OR ITEMS, ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. ENCODE CLEARLY THE TEST BOOKLET SERIES **A, B, C OR D** AS THE CASE MAY BE IN THE APPROPRIATE PLACE IN THE ANSWER SHEET.
3. You have to enter your Roll Number on the Test Booklet in the Box provided alongside. **Do NOT** write anything else on the Test Booklet.
4. This Test Booklet contains **100** items (Questions). Each item is printed in **English**. Each item comprises four responses (answers). You will select the response which you want to mark on the Answer Sheet. In case you feel that there is more than one correct response with you consider the best. In any case, choose **ONLY ONE** response for each item.
5. You have to mark all your responses **ONLY** on the separate Answer Sheet provided. See direction in the answers sheet.
6. All items carry equal marks. Attempt all items. Your total marks will depend only on the number of **correct responses** marked by you in the answer sheet. For **every incorrect** response **1/3rd of the allotted marks** will be deducted.
7. Before you proceed to mark in the Answer sheet the response to various items in the Test booklet, you have to fill in some particulars in the answer sheets as per instruction sent to you with your Admission Certificate.
8. After you have completed filling in all responses on the answer sheet and the examination has concluded, you should hand over to Invigilator only the answer sheet. You are permitted to take away with you the Test Booklet.
9. Sheet for rough work are appended in the Test Booklet at the end.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE ASKED TO DO SO

- 1.** With respect to Stockholm Convention, consider the following statements:
1. Stockholm Convention is a legally binding international agreement to protect human health and environment from Persistent Organic Pollutants (POPs).
 2. At present, 21 chemicals are covered under the Stockholm Convention
 3. India has ratified all the listed POPs under the Stockholm Convention.
- How many of the statements given above are correct?
- (a) Only one
 - (b) Only two
 - (c) All three
 - (d) None
- 2.** Consider the following statements regarding the 2025 World Para Athletics Championships:
1. The Championships were held in India for the first time.
 2. The mascot of the event was named Viraaj.
 3. India finished at the top of the medal table.
- Which of the statements given above are correct?
- (a) 1 and 2 only
 - (b) 2 and 3 only
 - (c) 1 and 3 only
 - (d) 1, 2 and 3
- 3.** Arrange the following states in the decreasing order of the installed capacity of the wind power:
1. Gujarat
 2. Tamil Nadu
 3. Karnataka
 4. Andhra Pradesh
- Select the correct answer using code given below.
- (a) 1-2-3-4
 - (b) 1-3-2-4
 - (c) 2-1-3-4
 - (d) 2-1-4-3
- 4.** Recently, the Hayli Gubbi volcano, which erupted after nearly 12,000 years, was in the news for its potential climatic impact. This volcano is located in:
- (a) Kenya
 - (b) Ethiopia
 - (c) Indonesia
 - (d) Papua New Guinea
- 5.** Which Indian city was recently recognized by UNESCO in 2025 as a “Creative City of Gastronomy” under its Creative Cities Network (UCCN)?
- (a) Jaipur
 - (b) Lucknow
 - (c) Indore
 - (d) Kolkata

- 6.** What does the term “Carbon Fertilization,” sometimes seen in discussions on climate-smart agriculture, refer to?
- The release of compressed carbon dioxide directly into crop fields to accelerate plant photosynthesis and boost yields.
 - A method of applying biochar directly to reduce soil salinity.
 - A geoengineering technique for capturing carbon from the atmosphere using large-scale agricultural sprayers.
 - A process of using carbon-rich compounds into irrigation systems to boost plant growth.
- 7.** Consider the following pairs:
- | <i>GI Tag</i> | <i>Associated State/Region</i> |
|----------------------|---------------------------------------|
| 1. Panna Diamond | : Maharashtra |
| 2. Apatani Textile | : Arunachal Pradesh |
| 3. Kani Shawls | : Jammu & Kashmir |
- Which of the above pairs is/are correctly matched?
- 1 only
 - 1 and 2 only
 - 3 only
 - 2 and 3 only
- 8.** Which of the following gases primarily contribute to acid rain?
- Sulfur dioxide
 - Nitrogen dioxide
 - Methane
- Select the correct answer using the code given below.
- 1 only
 - 2 and 3 only
 - 1 and 2 only
 - 1 and 3 only
- 9.** In the context of hazardous waste regulation in India, how many of the following items are prohibited for import under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016?
- Waste edible fats and oils
 - Metal scrap
 - Household e-waste
 - Solid Plastic Waste
- Select the correct answer using the code given below.
- 2 and 3 only
 - 1, 3 and 4 only
 - 2, 3 and 4 only
 - 1, 2, 3 and 4
- 10.** Consider the following pairs:
- | <i>Military exercises</i> | <i>Countries involved</i> |
|----------------------------------|----------------------------------|
| 1. Exercise Konkan | : India & United Kingdom |
| 2. Exercise Indra | : India & Sri Lanka |
| 3. Exercise Mitra Shakti | : India & Russia |
| 4. Exercise Garuda | : India & USA |
- How many of the above pairs are correctly matched?
- Only one
 - Only two
 - Only three
 - None
- 11.** The International Purple Fest 2025, recently celebrated in India, primarily aims to:
- Showcase India's traditional textile crafts to boost rural livelihoods
 - Promote accessibility, inclusivity and empowerment of persons with disabilities
 - Encourage eco-tourism and conservation of coastal biodiversity
 - Support digital literacy and cyber-safety among vulnerable communities

- 12.** The Government of India has recently launched the ‘Vishwas Scheme’ aimed at reducing litigation related to the Employees’ Provident Fund (EPF). This scheme has been introduced under which Ministry?
- Ministry of Finance
 - Ministry of Labour and Employment
 - Ministry of Corporate Affairs
 - Ministry of Personnel, Public Grievances and Pensions
- 13.** With reference to the Energy Conservation Building Code of India, consider the following statements:
- The Energy Conservation Building Code has been formulated by the Ministry of New and Renewable Energy.
 - The code is applicable to both government and private buildings.
 - The code addresses water efficiency along with the energy efficiency of the buildings.
- Which of the statements given above is/are correct?
- 1 and 3 only
 - 2 and 3 only
 - 2 only
 - 1 and 2 only
- 14.** Consider the following pollutants:
- Carbon dioxide
 - Carbon monoxide
 - Ozone
 - Mercury
 - Lead
- How many of the above pollutants are **not** covered in the WHO Air Quality Guidelines?
- Only two
 - Only three
 - Only four
 - All five
- 15.** Which of the following atmospheric components can contribute to the cooling of the Earth?
- Stratospheric water vapour reduction
 - Aerosols from phytoplankton
 - Black carbon deposition on ice
- Select the correct answer using the code given below.
- 1 and 2 only
 - 2 and 3 only
 - 1 and 3 only
 - 1, 2 and 3
- 16.** Consider the following statements with respect to Compostable plastics:
- Both plant-based and petroleum-based materials can be used to create compostable plastics.
 - Compostable plastics can be degraded through biological processes and yield only water and biomass.
- Which of the statements given above is/are correct?
- 1 only
 - 2 only
 - Both 1 and 2
 - Neither 1 nor 2
- 17.** Bio-methanation involves breaking complex organic matter into methane. Which of the following sequences correctly represents the transformation?
- Hydrolysis - Acidogenesis - Acetogenesis - Methanogenesis
 - Acetogenesis - Hydrolysis - Methanogenesis - Acidogenesis
 - Acidogenesis - Hydrolysis - Methanogenesis - Acetogenesis
 - Hydrolysis - Acetogenesis - Acidogenesis – Methanogenesis

- 18.** Consider the following statements regarding the Antarctic ozone hole:
1. It is a temporary thinning of the ozone layer that forms primarily during early spring in the southern hemisphere.
 2. Extremely low stratospheric temperatures over Antarctica facilitate the formation of a hole.
 3. Arctic ozone depletion is a much more severe, longer-lasting, and widespread thinning than Antarctic ozone hole.
- Which of the statements given above are correct?
- (a) 1 and 2 only
 - (b) 2 and 3 only
 - (c) 1 and 3 only
 - (d) 1, 2 and 3
- 19.** Consider the following fuels:
1. Natural gas
 2. Ethanol
 3. Hydrogen
 4. Methanol
- How many of the above given fuels can operate on fuel cells?
- (a) Only one
 - (b) Only two
 - (c) Only three
 - (d) All four
- 20.** Consider the following pairs:
- | <i>Alternative fuel</i> | <i>Produced from</i> |
|------------------------------|----------------------|
| 1. Renewable Gasoline | : Cellulose material |
| 2. Renewable Diesel | : Fats and oil |
| 3. Sustainable Aviation Fuel | : Woody biomass |
- How many pairs given above are correctly matched?
- (a) Only one
 - (b) Only two
 - (c) All three
 - (d) None
- 21.** In the context of Solid Waste Management (SWM) Rules, 2016, which of the following segregation categories are mandatory to be maintained by waste generators?
1. Biodegradable
 2. Non-Biodegradable Waste
 3. Domestic Hazardous Waste
 4. Industrial Waste
- Select the correct answer using the code given below.
- (a) 1, 2, and 3 only
 - (b) 1, 3 and 4 only
 - (c) 1, 2, 3 and 4 only
 - (d) 1, 3 and 4 only
- 22.** In the context of global agreements on ozone protection, which of the following is directly related to controlling ozone-depleting substances?
- (a) Paris Agreement
 - (b) Boon Convention
 - (c) Vienna Convention
 - (d) Kyoto Protocol

- 23.** With reference to the Bio-Medical Waste Management Rules, 2016, consider the following statements:
1. They mandate bar-coding of all bio-medical waste to ensure tracking from source to disposal.
 2. The Rules mandate colour-coded segregation of waste at the point of generation within each healthcare unit.
 3. Deep burial is permitted only in remote or rural regions where there is no access to common treatment facilities.
- How many of the statements given above are correct?
- (a) Only one
 - (b) Only two
 - (c) All three
 - (d) None
- 24.** Consider the following statements regarding the Montreal Protocol:
1. It is the first UN treaty to achieve universal ratification by all member states.
 2. The protocol initially targeted substances like Hydrofluorocarbons that directly deplete the ozone layer.
 3. The Protocol phases down Ozone Depleting Substances in a stepwise manner, with different timelines for developed and developing countries.
- How many of the statements given above are correct?
- (a) Only one
 - (b) Only two
 - (c) All three
 - (d) None
- 25.** Consider the following:
1. Thermoplastic Starch (TPS).
 2. Polylactic Acid (PLA)
 3. Cellophane
 4. Polyhydroxyalkanoates (PHA)
- How many of the above bioplastic are produced by bacteria through fermentation processes?
- (a) Only one
 - (b) Only two
 - (c) Only three
 - (d) All four
- 26.** Which of the following statements describes the aim of the SIGHT programme?
- (a) To provide incentives for manufacturing of electrolyzers and production of green hydrogen
 - (b) To provide farmers with solar pumps and grid-connected solar power plants
 - (c) To promote wind power projects through private sector investment
 - (d) To promote green energy corridors by providing viability gap funding
- 27.** Under the Noise Pollution (Regulation and Control) Rules 2000, who is the competent authority that categorizes the areas into industrial, commercial, residential or silence areas for the purpose of implementation of noise standards in India?
- (a) State Government
 - (b) District Collector
 - (c) Central Pollution Control Board
 - (d) State Pollution Control Board

- 28.** Consider the following statements regarding the Bio-CNG:
1. It has less energy potential than biogas.
 2. It is produced by blending biogas with 10% CNG at standard atmospheric pressure.
 3. It is exactly similar in composition but many times cleaner when compared to fossil based CNG.
- How many of the statements given above are correct?
- (a) Only one
 - (b) Only two
 - (c) All three
 - (d) None
- 29.** With reference to the World Conservation Congress, consider the following statements:
1. The Congress is organised by the International Union for Conservation of Nature to strengthen global environmental governance.
 2. It brings together governments, scientists and civil society to set priorities for biodiversity conservation worldwide.
 3. The Recent World Conservation Congress 2025 was concluded in Belém, Brazil.
- How many of the statements given above are correct?
- (a) Only one
 - (b) Only two
 - (c) All three
 - (d) None
- 30.** Consider the following statements with respect to Energy Saving Certificates (ESCert):
1. ESCerts are issued to those plants that have achieved excess energy savings over their targets under Perform Achieve and Trade (PAT) scheme.
 2. The Bureau of Energy Efficiency (BEE) is the administrator for the Energy Savings Certificates (ESCert) mechanism.
 3. One Energy Saving Certificate is equivalent to 1000 metric Tonne of Oil Equivalent (MTOE).
- How many of the above statements are correct?
- (a) Only one
 - (b) Only two
 - (c) All three
 - (d) None
- 31.** Consider the following statements with regard to G20 (Group of Twenty):
1. The G20 Summit 2025 was held in Johannesburg, South Africa.
 2. The theme for the 2025 Summit was “Solidarity, Equality and Sustainability.”
 3. Countering the Drug-Terror Nexus is one of India’s G20 priorities.
- Which of the statements given above is/are correct?
- (a) 1 only
 - (b) 2 and 3 only
 - (c) 1 and 3 only
 - (d) 1, 2 and 3

32. Consider the following pairs:

Ramsar Site	State
Gokul Reservoir	Bihar
Udaipur Jheel	Rajasthan
Gogabeel Lake	Assam
Udhwa Lake	Jharkhand

How many of the above pairs are correctly matched?

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

33. What does the term “Bamako Convention,” sometimes seen in the news, refer to:

- (a) A UN agreement to reduce marine plastic pollution through global extended producer responsibility norms.
- (b) A WTO framework for monitoring hazardous chemical trade among developing countries.
- (c) A global pact under the Basel Convention allows controlled export of e-waste to least developed countries.
- (d) A treaty of African nations prohibiting the import of any hazardous waste.

34. Consider the following pairs:

Renewable energy projects	Location
----------------------------------	-----------------

1. Puga Geothermal Energy Project	: Ladakh
2. Bhadla Solar Park	: Gujarat
3. Brahmanvel Wind Farm	: Maharashtra
4. Gobar-Dhan Bio-CNG Plant	: Madhya Pradesh
5. Simhadri Floating Solar PV Plant	: Karnataka

How many of the above pairs are correctly matched?

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

35. Consider the following activities

- 1. Mining project involving atomic minerals
- 2. Modernisation of Irrigation projects
- 3. Construction of Townships

How many of the above activities are exempted from public consultation under Environment Impact Assessment?

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

36. With reference to the Basel Convention, consider the following statements:

- 1. The convention aims to control the transboundary movement of hazardous wastes.
- 2. India is a party to the convention.
- 3. Basel Convention is the only global legally binding instrument to address plastic waste.

Which of the statements given above is/are correct?

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

37. Recently, the United Nations Climate Change Conference or Conference of the Parties (COP) of the UNFCCC, COP30, was held. The conference was held at:

- (a) Geneva, Switzerland
- (b) Baku, Azerbaijan
- (c) Belém, Brazil
- (d) Doha, Qatar

- 38.** In the context of artificial rainfall enhancement, How many of the following substances are commonly used in cloud-seeding techniques?
1. Silver iodide
 2. Sodium chloride
 3. Potassium permanganate
 4. Dry ice (solid carbon dioxide)
- Select the correct answer using the code given below.
- (a) Only one
 - (b) Only two
 - (c) Only three
 - (d) All four
- 39.** Consider the following indicators:
1. Undernourishment
 2. Child stunting
 3. Child wasting
 4. Maternal mortality
- How many of the above indicators are used to compute the Global Hunger Index (GHI)?
- (a) Only one
 - (b) Only two
 - (c) Only three
 - (d) All four
- 40.** With reference to the Global Alliance to Eliminate Lead Paint:
1. The Global Alliance to Eliminate Lead Paint is a joint undertaking of the United Nations Environment and the World Health Organization.
 2. The objective of the alliance is to prevent children's exposure to lead from paint and to minimize occupational exposures to lead paint.
- Which of the statements given above is/are correct?
- (a) 1 only
 - (b) 2 only
 - (c) Both 1 and 2
 - (d) Neither 1 nor 2
- 41.** Consider the following statements with respect to India's renewable energy sector:
1. Solar energy accounts for more than 40% of India's total Renewable Energy capacity.
 2. India is ranked 4th globally in Renewable Energy (RE) Installed Capacity,
 3. One of India's Panchamrit goal is to achieve 1000 GW of non-fossil energy capacity by 2030.
- How many of the above statements are correct?
- (a) Only one
 - (b) Only two
 - (c) All three
 - (d) None
- 42.** In the context of environment, the term “Grasshopper Effect” is related to
- (a) Spreading of Persistent Organic Pollutants to the Arctic region.
 - (b) Decline in grasshopper populations due to climate change impact.
 - (c) Increase in grasshopper populations due to climate change impact.
 - (d) Spread of zoonotic diseases through grasshoppers.
- 43.** Which one of the following organisations released the report titled “State of the Climate in Asia 2024”?
- (a) United Nations Environment Programme
 - (b) World Meteorological Organisation
 - (c) Intergovernmental Panel on Climate Change
 - (d) Asian Development Bank

- 44.** Consider the following statements about the Underground Coal Gasification (UCG):
1. Underground coal gasification is the in-situ process of converting hydrocarbon materials into synthesis gas.
 2. Using UCG technologies, coal seams that are uneconomical to mine can be exploited.
 3. Underground gasification methods can cause contamination of groundwater.
- Which of the statements given above is/are correct?
- (a) 1 only
 - (b) 2 only
 - (c) 1 and 2 only
 - (d) 1, 2 and 3
- 45.** The term “Kafala System”, often seen in the news in the context of:
- (a) Regulation of migrant labour in several Gulf countries
 - (b) Registration of Islamic charitable endowments in West Asia
 - (c) Cross-border sponsorship of religious education in the Middle East
 - (d) Monitoring of financial remittances sent by expatriate workers
- 46.** In India “Critically Polluted Areas” are declared under which one of the following acts/rules?
- (a) The Factories Act, 1948
 - (b) The Environment (Protection) Act, 1986
 - (c) Water (Prevention And Control Of Pollution) Act, 1974
 - (d) Solid Waste Management Rules (SWM Rules), 2016
- 47.** Consider the following statements:
1. White category industries do not require prior approval from state pollution control boards to establish and operate.
 2. White category industries plants scored up to 30 on the pollution index.
- Which of the statements given above is/are correct?
- (a) 1 only
 - (b) 2 only
 - (c) Both 1 and 2
 - (d) Neither 1 nor 2
- 48.** “Maitri II” and “Bharti”, recently seen in the news, are related to which of the following?
- (a) India’s research stations in Antarctica
 - (b) India’s proposed deep-sea mining projects in the Indian Ocean
 - (c) India’s new solar observatories planned in Ladakh
 - (d) India’s indigenously developed quantum communication satellites
- 49.** In the context of the Global River Cities Alliance, consider the following statements:
1. This alliance was initiated by India in the National Mission for Clean Ganga.
 2. It was launched at the United Nations Climate Change Conference (COP 29) in 2024.
- Which of the statements given above is/are correct?
- (a) 1 only
 - (b) 2 only
 - (c) Both 1 and 2
 - (d) Neither 1 nor 2

- 50.** The Carbon Border Adjustment Mechanism (CBAM) which imposes a carbon-based charge on imported goods is an initiative of
- The United States of America
 - European Union
 - G20
 - OECD
- 51.** How many of the following are examples of precision biotherapeutics?
- CAR-T cell therapy
 - Monoclonal antibodies
 - mRNA vaccines
 - CRISPR-Cas9 gene correction
- Select the correct answer using the code given below:
- Only one
 - Only two
 - Only three
 - All four
- 52.** Which of the following physical phenomena forms the fundamental basis of time measurement in a modern quantum clock?
- The frequency of nuclear decay in radioactive isotopes.
 - Light frequency from an electron's energy-level transition
 - The speed of light in a vacuum measured using laser interferometry
 - The stable oscillation of quartz crystals under an applied voltage
- 53.** BioTRIG technology" is talked about in which one of the following contexts?
- Waste-to-energy technology based on the pyrolysis process.
 - Degradation of nuclear waste using microorganisms.
 - Degradation of plastic waste using microorganisms and enzymes.
 - Development of building materials using plant residues.
- 54.** Consider the following statements with respect to Ocean Thermal Energy Conversion (OTEC) technologies:
- OTEC technologies use the temperature difference between warm seawater at the surface of the ocean, and cold seawater at a depth to produce electricity.
 - Open Cycle OTEC uses seawater as the working fluid.
 - At present, 1000 MW-capacity plants have been built in the Scandinavian region using OTEC technology.
- How many of the above statements are correct?
- Only one
 - Only two
 - All three
 - None
- 55.** The 2025 Nobel Prize in Economic Sciences was awarded for which of the following contributions?
- Explaining innovation-driven growth and the role of creative destruction
 - Developing behavioural models incorporating psychological biases
 - Providing empirical evidence on poverty alleviation using RCTs
 - Formulating the modern theory of international trade

- 56.** Consider the following statements with respect to Persistent Organic Pollutants (POPs):

Statement I: Persistent Organic Pollutants accumulate in terrestrial and aquatic ecosystems.

Statement II: POPs are soluble in fatty tissue and resist breakdown in water.

Which one of the following is correct in reference to 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, but 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.

- 57.** Dry sorbent injection and wet limestone treatment method are well known for the:

- (a) production of Hydrogen
- (b) remove sulfur dioxide from coal-fired power plants
- (c) ground water treatment
- (d) restoration of coral reefs

- 58.** Consider the following statements regarding the Association of Southeast Asian Nations (ASEAN):

- 1. The 47th ASEAN Summit was held in Kuala Lumpur, Malaysia.
- 2. ASEAN currently has a total of 10 member states.
- 3. India has a Comprehensive Strategic Partnership with ASEAN.

How many of the above statements are correct?

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

- 59.** Consider the following pairs:

Report/Index	Released by
1. Adaptation Gap Report	: IUCN 2025
2. World Investment Report	: UNCTAD
3. World Economic Outlook	: International Monetary Fund (IMF)

How many of the above pairs are correctly matched?

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

- 60.** Consider the following statements regarding the 2025 East Asia Summit (EAS):

- 1. The 2025 East Asia Summit was hosted by Laos.
- 2. India is a founding member of the East Asia Summit.

Which of the statements given above is/are correct?

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

- 61.** Consider the following pairs:

Region often mentioned in news	Reason for being in news
1. Scarborough Shoal	: Island dispute between China and the Philippines
2. Fergana Valley	: Insurgency in Mozambique
3. Cabo Delgado	: Border conflict in Central Asia

How many of the above pairs are correctly matched?

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

- 62.** Consider the following pairs with reference to the generation of biofuel and their source:

Biofuels	Food Crop
1. 1st Generation	: Rice Husk
2. 2nd Generation	: Corn
3. 3rd Generation	: Specially engineered Algae

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

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

- 63.** Consider the following statements with respect to Green Energy Open Access:

- 1. The Green Energy Open Access rules were notified under the Energy Conservation Act, 2001.
- 2. Green Open Access is now permitted for all consumers, with the minimum transaction limit set at 100 kW.
- 3. Under the rules, Discoms would be obligated to procure and supply green power to eligible consumers who demand green energy.

How many of the above statements are correct?

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

- 64.** Consider the following appliances:

- 1. LED Lamps
- 2. Room Air Conditioner
- 3. Ceiling fans
- 4. Chillers
- 5. Colour Television

How many of the above appliances fall under mandatory star-labelling requirements under the Standards & Labeling Programme?

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

- 65.** What does the term “RECLAIM Framework,” sometimes seen in the news, refer to:

- (a) A UN initiative to help countries restore degraded coastal ecosystems through mangrove afforestation and coral rehabilitation.
- (b) A WTO mechanism that allows developing countries to reclaim tariff concessions lost during trade disputes.
- (c) A national programme to recover agricultural land from desertification by using micro-irrigation and soil-amendment technologies.
- (d) A community engagement and development model for mine closure and repurposing.

- 66.** The Green Hydrogen Certification Scheme in India (GHCI) was launched to promote the production and use of Green Hydrogen. In this context, consider the following statements:

- 1. The Green Hydrogen certificate shall be mandatory for Green Hydrogen producers who intends to sell green hydrogen in India.
- 2. The Greeh Hydrogen certificate can be used for the purpose of claiming carbon credit under Carbon Credit Trading Scheme (CCTS).
- 3. Electrolysis and Conversion of Biomass are production pathways currently considered within the scope of the scheme.

Which of the statements given above are correct?

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

- 67.** Recently, the MoEFCC has notified the Management of Contaminated Sites Rules, 2025. In this regard consider the following statements:
1. These rules are made under the Environment (Protection) Act, 1986.
 2. These rules apply to sites contaminated by radioactive waste, mining, marine oil spills, or solid waste dumps
 3. It mandates that local bodies are required to report suspected contaminated sites twice a year to the State Pollution Control Boards.
- How many of the statements given above are correct?
- (a) Only one
 - (b) Only two
 - (c) All three
 - (d) None
- 68.** What does the term “Belém Package,” sometimes seen in the news, refers to:
- (a) A global trade agreement to liberalise tariffs on ‘green’ technologies under WTO, negotiated at Rio de Janeiro in 2025.
 - (b) A UNFCCC measures on just transition, adaptation finance, trade-climate linkages, gender action, and technology cooperation.
 - (c) A UN plan for post-2025 global biodiversity targets under the Convention on Biological Diversity (CBD), focusing on marine conservation and protected areas.
 - (d) A funding mechanism to support only fossil-fuel-based energy projects in developing countries to ensure energy security during transition.
- 69.** What is common to places known as Muppandal, Brahmanvel and Vaspet?
- (a) Water reservoirs
 - (b) Underground cave system
 - (c) Wind energy farms
 - (d) Tropical rain forests
- 70.** Consider the following statement with respect to Biogas:
1. Anaerobic digestion of organic materials results in the formation of biogas.
 2. In Biogas, the percentage of methane is higher than that of carbon dioxide.
 3. Biogas is lighter than air, which makes the risk of fire accidents much lower than with LPG.
- How many of the statements given above are correct?
- (a) Only one
 - (b) Only two
 - (c) All three
 - (d) None
- 71.** How many of the following factors influence ocean acidification?
1. Sea Surface Temperature
 2. Salinity
 3. Particulate Organic Carbon
 4. Particulate Inorganic Carbon
 5. Dissolved Oxygen
- Select the correct answer using the code given below.
- (a) Only two
 - (b) Only three
 - (c) Only four
 - (d) All five

- 72.** With reference to Arsenic, consider the following statements:
1. Long-term exposure to arsenic can cause skin cancer.
 2. Arsenic is naturally present in the tobacco plant.
 3. Arsenic in water is significantly less toxic than arsenic in seafood.
- How many of the above statements are correct?
- (a) Only one
 - (b) Only two
 - (c) All three
 - (d) None
- 73.** Consider the following statement with respect to the Minamata Convention:
1. It was the result of catastrophic pollution in Minamata, Japan, where industrial releases of methylmercury caused Minamata disease.
 2. It is the world's first legally binding treaty to phase out highly toxic mercury pollution.
- Which of the statements given above is/are correct?
- (a) 1 only
 - (b) 2 only
 - (c) Both 1 and 2
 - (d) Neither 1 nor 2
- 74.** Consider the following statements with respect to Solar Energy Corporation of India Ltd (SECI):
1. It is a Power Trading Licensee for trading power on Pan-India basis.
 2. It owns and operates Renewable Energy projects.
 3. It offers Project Management Consultancy in Renewable Energy sector to Government entities.
 4. It undertakes business areas, including green Hydrogen and greening the Transport Sector.
- How many of the above statements are correct?
- (a) Only one
 - (b) Only two
 - (c) Only three
 - (d) All four
- 75.** With reference to the Rotterdam Convention, consider the following statements:
1. It is an international agreement which aims to ensure the safe handling, transport, and use of living-modified organisms (LMOs).
 2. It creates legally binding obligations for the implementation of the Prior Informed Consent (PIC) procedure.
 3. International trade of pesticides Iprodione and Terbufos have been included for the "prior informed consent" (PIC) procedure under it.
- How many of the above statements are correct?
- (a) Only one
 - (b) Only two
 - (c) All three
 - (d) None

- 76.** In the context of ozone depletion, which of the following are classified as Ozone-Depleting Substances (ODS)?
1. Hydrofluorocarbons
 2. Halons
 3. Carbon tetrachloride
 4. Methyl Bromide
 5. Methyl Chloroform
- Select the correct answer using the code given below:
- (a) 1, 3 and 5 only
 - (b) 1, 2 and 4 only
 - (c) 2, 3, 4 and 5 only
 - (d) 1, 2, 3, 4 and 5 only
- 77.** Consider the following statements with reference to Bisphenol A (BPA):
1. Bisphenol A is a polycarbonate that is used in reusable plastic bottles.
 2. BPA is considered as the hazardous chemical due to its ability to cause infertility in humans.
- Which of the statements given above is/are correct?
- (a) 1 only
 - (b) 2 only
 - (c) Both 1 and 2
 - (d) Neither 1 nor 2
- 78.** Consider the following statements:
1. Tropospheric ozone is a short-lived climate pollutant.
 2. Tropospheric ozone is created by chemical reactions between oxides of sulfur and volatile organic compounds (VOCs) in the presence of sunlight.
 3. Tropospheric ozone affects cloud formation and precipitation levels.
- How many of the above statements are correct?
- (a) Only one
 - (b) Only two
 - (c) All three
 - (d) None
- 79.** Consider the following statements regarding the United Nations Human Rights Council (UNHRC):
1. Recently, India was elected to serve on the UNHRC for the 2026–2028 term.
 2. UNHRC has 193 member states that participate in its deliberations and voting.
 3. Members of the UNHRC are elected by the United Nations General Assembly (UNGA).
- Which of the statements given above is/are correct?
- (a) 2 only
 - (b) 3 only
 - (c) 1 and 3
 - (d) 2 and 3
- 80.** Consider the following statements regarding Long Term Low Emission Development Strategy (LT-LEDS) of India:
1. It envisages a threefold increase in nuclear energy capacity by 2032.
 2. The strategy is based on India's right to an equitable and fair share of the global carbon budget.
- Which of the statements given above is/are correct?
- (a) 1 only
 - (b) 2 only
 - (c) Both 1 and 2
 - (d) Neither 1 nor 2

- 81.** Consider the following statements regarding the United Nations Decade on Ecosystem Restoration:
1. The initiative is jointly led by the United Nations Environment Programme and the Food and Agriculture Organization.
 2. It covers ecosystem restoration in forests, grasslands, mountains, and oceans only.
 3. The Decade mandates commitments from all UN member countries to restore ecosystems.
- Which of the statements given above is/are correct?
- (a) 1 only
 - (b) 1 and 2 only
 - (c) 2 and 3 only
 - (d) 1 and 3 only
- 82.** Consider the following statements regarding the Graded Response Action Plan (GRAP):
1. GRAP implementation is enforced by the Commission for Air Quality Management.
 2. GRAP is an emergency response mechanism for the entire India, based on Average AQI levels.
- Which of the statements given above is/are correct?
- (a) 1 only
 - (b) 2 only
 - (c) Both 1 and 2
 - (d) Neither 1 nor 2
- 83.** What is “Indrajaal”, sometimes seen in the news?
- (a) A quantum-encryption communication platform used by the armed forces
 - (b) A multi-target tracking radar system deployed on the northern borders
 - (c) India’s first AI-powered autonomous counter-drone defence system
 - (d) A satellite-based battlefield surveillance project of ISRO
- 84.** Consider the following statements with respect to pyrolysis:
1. Pyrolysis is a process of chemically decomposing organic materials at elevated temperatures in the absence of oxygen.
 2. Methane, Carbon dioxide and Hydrogen are important components of syngas produced during pyrolysis.
- Which of the statements given above is/are correct?
- (a) 1 only
 - (b) 2 only
 - (c) Both 1 and 2
 - (d) Neither 1 nor 2
- 85.** Consider the following pairs:
- | Traditional festival | State |
|-----------------------------|--------------|
| 1. Ningol Chakouba | : Manipur |
| 2. Kati Bihu | : Odisha |
| 3. Bathukamma | : Telangana |
- Which of the above pairs are correctly matched?
- (a) 1 and 2 only
 - (b) 2 and 3 only
 - (c) 1 and 3 only
 - (d) 1, 2 and 3
- 86.** Consider the following pair:
- | Chemical | Contained in |
|-----------------|----------------------------|
| 1. Aspartame | : Chewing gum |
| 2. Styrene | : Food packaging materials |
| 3. Parabens | : Cosmetic products |
- How many of the above pairs are correctly matched?
- (a) Only one
 - (b) Only two
 - (c) All three
 - (d) None

- 87.** With reference to international chess titles, consider the following statements:
1. The title of Grandmaster (GM) is awarded by FIDE.
 2. To become a Grandmaster, a player must achieve a FIDE rating of 2500 or above at least once.
 3. India has more than 90 Grandmasters as of December 2025.
- How many of the above statements are correct?
- (a) Only one
(b) Only two
(c) All three
(d) None

- 88.** Consider the following:
1. Stockholm Convention
 2. Rotterdam Convention
 3. Basel Convention
 4. Minamata Convention
- Arrange the above mentioned conventions in chronological order of their formation.
- (a) 3-2-1-4
(b) 4-2-3-1
(c) 3-4-1-2
(d) 4-1-2-3

- 89.** Consider the following statements:
1. The use of biomass for energy causes no net increase in carbon dioxide emissions to the atmosphere
 2. Biogas is more efficient than cow dung as a fuel.
 3. Higher the lignin content in the wood, lower the heating value.
- Which of the statements given above are correct?
- (a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

- 90.** Consider the following statements with respect to Biomass which affect the process of gasification:
1. As the calorific value increases, the amount of gas produced at the normal temperature and pressure increases.
 2. A high volatile-matter content in biomass results in the formation of greater amounts of tar.
 3. As the fixed carbon content increases, the calorific value of the producer gas derived from biomass also increases.
- How many of the above statements are correct?
- (a) Only one
(b) Only two
(c) All three
(d) None

- 91.** Recently, which of the following nations announced the launch of the Global Outlook Council on Water Investments (GOCWI)?
- (a) India
(b) South Africa
(c) Brazil
(d) China

- 92.** With reference to Direct air capture (DAC) technologies, consider the following statements:
1. Direct air capture (DAC) technologies extract carbon dioxide directly from the atmosphere at any location.
 2. Direct air capture technologies employ solid sorbents method to capture carbon dioxide.
 3. Capturing carbon dioxide from the air is the least expensive method of carbon capture.

- How many of the statements given above are correct?
- (a) Only one
(b) Only two
(c) All three
(d) None

- 93.** The term 'e-fuel' is often seen in the news. Which of the following statements best defines the term 'e-fuel'?
- A fuel based on fossil fuels and advanced refining techniques.
 - A type of fuel produced from genetically modified crops.
 - A type of fuel produced from renewable energy and captured carbon dioxide.
 - A type of fuel derived from organic matter like plant oils and animal fats.

- 94.** Consider the following pairs:

Geopolitical Flashpoints	Countries Involved
---------------------------------	---------------------------

- Sir Creek : India & Sri Lanka
- Blue Line : Israel & Palestine
- Durand Line : Pakistan & Afghanistan

How many of the above pairs are correctly matched?

- Only one
- Only two
- All three
- None

- 95.** With reference to the Equator Initiative Award, consider the following statements:

- It mandates recognising local and indigenous communities for their achievements in conservation and sustainable development.
- It is organised by the United Nations Development Programme.

Which of the statements given above is/are correct?

- 1 only
- 2 only
- Both 1 and 2
- Neither 1 nor 2

- 96.** Consider the following statements regarding the 'Maratha Military Landscapes of India':
- The 'Maratha Military Landscapes of India' has recently been inscribed as India's 44th UNESCO World Heritage Site.
 - All the forts included in this cultural landscape are located within the state of Maharashtra.
- Which of the statements given above is/are correct?
- 1 only
 - 2 only
 - Both 1 and 2
 - Neither 1 nor 2

- 97.** With reference to methane emission, which of the following statements is/are correct?
- More than half of methane emissions come from human activities.
 - Wetlands are the largest natural source of methane emissions.
 - Fossil Fuels is the largest human source of methane emissions.

Select the correct answer using the code given below.

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

- 98.** Consider the following statements with reference to Carbon Credits:

- They operate on a Cap-and-Trade system.
 - One carbon credit represents one metric ton of carbon dioxide equivalent emissions.
 - They can be traded on the stock market.
- Which of the statements given above is/are correct?
- 2 only
 - 1 and 2 only
 - 1 and 3 only
 - 1, 2 and 3

- 99.** Air Quality Management Exchange Platform (AQMex) belongs to which one of the following organizations?
- World Health Organization
 - International Union of Air Pollution Prevention and Environmental Protection Associations
 - The Climate and Clean Air Coalition
 - Food and Agriculture Organization
- 100.** With respect to Solid Waste Management Rules, 2016, consider the following statements:
- Ministry of Housing and Urban Affairs responsible for overall monitoring the implementation of The Solid Waste Management Rules, 2016.
 - As per the rules, responsibility of generators of waste required segregate waste into three Wet, Dry and Hazardous Waste.
 - As per rules bio-degradable waste should be processed and treated through bio-methanation method.

Which of the statements given above is/are correct?

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

Copyright © by Vision IAS

All rights are reserved. No part of this document may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior permission of Vision IAS.

ANSWERS & EXPLANATIONS
GENERAL STUDIES (P) TEST – 6328

- Q 1. A**
- **The Stockholm Convention, ratified by India in 2006, is a global legally binding treaty to protect human health and environment from Persistent Organic Pollutants (POPs).** POPs are chemicals that remain intact in the environment for long periods, become widely distributed geographically, accumulate in the fatty tissue of living organisms and are toxic to human beings and wildlife. POPs travel globally and can cause damage wherever they travel. Each country is required to develop a plan for implementing its obligations under the Convention. Hence, statement 1 is correct.
 - Initially, twelve POPs have been recognized as causing adverse effects on humans and the ecosystem such as aldrin, chlordane, DDT etc. These initial 12 POPs are popularly termed as Dirty Dozen. **But after subsequent amendments to the convention more POPs are added to the list hence at present, 34 chemicals are covered under the Stockholm Convention.** Hence, statement 2 is not correct.
 - **As of now, India has ratified the 12 initially listed POPs. and also approved the ratification of seven (7) chemicals listed under Stockholm Convention on Persistent Organic Pollutants (POPs) such as Chlordane, Hexabromobiphenyl, Hexabromodiphenyl ether.** Hence, statement 3 is not correct.

- Q 2. A**
- The 2025 World Para Athletics Championships (the 12th edition) were held in New Delhi, India, from September 27 to October 5, 2025. This **marked the first time the event was hosted in India**, and the largest Para sport event ever held in the country. Hence, statement 1 is correct.
 - **The official mascot for the Indian Oil New Delhi 2025 World Para Athletics Championships was named Viraaj.** Viraaj is depicted as a spirited young elephant with a blade prosthesis, symbolizing strength, optimism, and the resilience of para-athletes. Hence, statement 2 is correct.
 - While India achieved its best-ever performance with a record 22 medals (6 Gold, 9 Silver, 7 Bronze), they did not finish at the top. The top of the medal table was secured by Brazil (15 Gold, 20 Silver, 9 Bronze, Total 44). India finished in 10th position in the final medal tally.
 - Hence, statement 3 is not correct.

- Q 3. A**
- India's wind energy sector is led by indigenous wind power industry and has shown consistent progress. The expansion of the wind industry has resulted in a strong ecosystem, project operation capabilities and manufacturing base of about 18000MW per annum. The country currently has the fourth highest wind installed capacity in the world.
 - The Government is promoting wind power projects in entire country through private sector investment by providing various fiscal and financial incentives such as Accelerated Depreciation

benefit; concessional custom duty exemption on certain components of wind electric generators.

- As per the latest available data, **Gujarat (14,493.38 MW) has the highest installed wind-power capacity, followed by Tamil Nadu (11,938.34 MW), Karnataka (8,193.29 MW)**, Maharashtra (5,716.31 MW), Rajasthan (5,208.75 MW), **Andhra Pradesh (4,397.78 MW)**, Madhya Pradesh (3,448.15 MW), Kerala (71.52 MW), Telangana (128.10 MW), and West Bengal (4.30 MW). Hence, option (a) is the correct answer.

- Q 4. B**
- Hayli Gubbi is a shield volcano located in the Afar Region of Ethiopia. It is the southernmost volcano of the Erta Ale Range. Until November 2025, there was no known record of any Holocene era eruptions of this volcano, although records of eruptions in the area are limited by the remoteness of the region. Hence, option (b) is the correct answer.



- Q 5. B**
- The Indian city recently designated by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) as a Creative City of Gastronomy in 2025 is Lucknow. Hence, option (b) is the correct answer.
 - Designation:** Lucknow was included in the UNESCO Creative Cities Network (UCCN) in the category of Gastronomy during the 43rd Session of the UNESCO General Conference in Samarkand, Uzbekistan, on World Cities Day (October 31, 2025).
 - Reason for Recognition:** The designation celebrates Lucknow's centuries-old, rich culinary heritage, particularly its renowned Awadhi cuisine, known for its unique cooking techniques (like dum pukht) and iconic dishes such as Galouti Kebabs, Nihari-Kulcha, and the distinctive Awadhi Biryani. The recognition also highlights the city's commitment to preserving traditional food craftsmanship and promoting culinary tourism.
 - Indian Context:** With this recognition, Lucknow becomes the second Indian city to receive the "City of Gastronomy" title. The first was Hyderabad, which was designated in 2019.

• Indian Cities Recognized under UCCN:

City	Field of Recognition	Year
Jaipur	Crafts and Folk Arts	2015
Varanasi	Music	2015
Chennai	Music	2017
Mumbai	Film	2019
Hyderabad	Gastronomy	2019
Srinagar	Crafts and Folk Arts	2021
Kozhikode	Literature	2023
Gwalior	Music	2023
Lucknow	Gastronomy	2025

Q 6. D Carbon fertigation refers to using carbon-based materials (like humic acids, biochar) or enriching irrigation water/atmosphere with carbon dioxide (CO₂) to boost plant growth, improve nutrient uptake, enhance water efficiency, and increase crop yield by fueling photosynthesis and soil health, making it a sustainable method to enhance agricultural output and reduce environmental impact.

Types of Carbon Fertigation

- CO₂ Enrichment: Artificially increasing CO₂ in greenhouses (carbon fertilization) boosts photosynthesis and water use efficiency, leading to faster growth.
- Carbon-Based Fertilizers: Applying organic carbon sources like humic acids or biochar through irrigation:
- Humic Acid: Improves soil structure, root growth, nutrient absorption, and plant resistance to stress.
- Biochar: Acts as a slow-release nutrient carrier, improving soil fertility and microbial life, reducing nutrient loss.

Benefits in Agriculture

- Increased Yields: Faster growth, more biomass, and better fruit quality.
- Improved Nutrient Efficiency: Better uptake of existing nutrients and reduced fertiliser runoff.
- Enhanced Soil Health: Increased organic matter, beneficial microbes, and cation exchange capacity.
- Better Stress Resistance: Plants become more resilient to drought, cold, pests, and diseases.
- Reduced Carbon Footprint: Fertigation itself minimises emissions from fertiliser application, while carbon-based products can sequester carbon.

Hence, option (d) is the correct answer.

Q 7. D • The Panna diamond mines, the only operational source of diamonds in India, are located in the Panna district of Madhya Pradesh, not Maharashtra. **The product was recently awarded the GI tag for being a natural good from this region. Hence, pair 1 is not correctly matched.**

• **The Apatani weave is a traditional craft practiced by the Apatani tribe residing in the Ziro Valley of Arunachal Pradesh.** It is known for its intricate geometric and zigzag patterns and has been granted the GI tag. **Hence, pair 2 is correctly matched.**

• The exquisite hand-woven **Kani Shawl originates from the Kanihama area of the Kashmir Valley in Jammu and Kashmir** and holds the GI tag, protecting its unique traditional

craftsmanship. Hence, pair 3 is correctly matched.

Q 8. C **Sulfur dioxide** and **nitrogen dioxide** are soluble in water and during rains these oxides react with large quantities of vapour present in the atmosphere to form acids like sulphuric acid, sulphurous acid, nitric acid nitrous acid. These acids when precipitates as rain or snow create acid rain.

Q 9. B The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 (as amended) strictly prohibit the import of certain waste materials into India, generally to prevent the country from becoming a dumping ground for hazardous waste and to promote domestic recycling/management capacity.

Wastes Prohibited for Import (Schedule VI)

Hazardous Wastes for Final Disposal:

- No hazardous waste can be imported into India for the purpose of final disposal (i.e., landfill or incineration). Imports are generally only permitted for the purpose of reuse, recycling, recovery, or co-processing by authorised actual users.

Specific Categories of Wastes:

- Household waste.
- **Waste edible fats and oil of animal or vegetable origin.**
- Tyres for direct re-use purpose.
- **Solid Plastic Waste**, including polyethylene terephthalate (PET) bottles (although specific conditions and amendments may exist for certain plastic types for recycling).
- Critical care medical equipment (for reuse).
- **Waste Electrical and Electronic Assemblies scrap (E-waste scrap)**, which includes whole assemblies of electrical and electronic equipment (separate rules govern the import of used electronic items for refurbishment/re-export under specific conditions).
- Other chemical wastes, especially in solvent form.

Metal scrap: The import of metal scrap and paper waste is generally allowed for actual users (industries) for recycling and reuse purposes without requiring specific permission from the environment ministry, as they are recognized as resources. Therefore, it is not a prohibited item for import under these rules.

Hence, option (b) is the correct answer.

Q 10. A • **About Exercise Konkan**

- Participants: Indian Navy and the United Kingdom's Royal Navy
- Frequency: Biennial (every two years)
- First held: 2004
- 2025 edition: Took place from October 5–12, 2025, off the western coast of India
- **Key features of the 2025 exercise:**
 - Involved the Carrier Strike Groups (CSGs) of both countries for the first time.
 - Included a harbor phase with professional interactions and a sea phase with complex operational drills.
- **Purpose:**
 - To enhance combined maritime and air capabilities.
 - To improve interoperability and build a stronger defense partnership.

- To reaffirm commitment to a secure, open, and inclusive Indo-Pacific region. **Hence, pair 1 is correctly matched.**
- **Army Exercise: INDRA 2025**
 - Dates: October 6–15, 2025
 - Location: Mahajan Field Firing Range, Bikaner, Rajasthan
 - Objectives: **Strengthen coordination between the Indian and Russian armies** for counter-terrorism operations and modern warfare scenarios. **Hence, pair 2 is not correctly matched.**
 - Activities: Joint tactical exercises, live-fire training, close-quarter combat in desert conditions, and simulated hostage-rescue missions
- **Exercise Mitra Shakti 2025** was an annual joint military drill between the **armies of India and Sri Lanka**, held at the Foreign Training Node in Belagavi, Karnataka. The exercise focused on joint tactical drills for counter-terrorism and peacekeeping operations under a UN mandate in a semi-urban environment. Key aspects included high-intensity drills, drone and counter-drone operations, casualty evacuation, and joint live firing. **Hence, pair 3 is not correctly matched.**
- **Exercise Garuda** is a **bilateral air force exercise between the Indian Air Force and the French Air and Space Force**. The first edition of the exercise was held in 2003 at Gwalior AFS. The debut exercise was witnessed by Chief of Staff of the FASF. The joint exercise between India and the USA is Yudh Abhyas (Army) or Malabar (Naval, with Japan and Australia). **Hence, pair 4 is not correctly matched.**

- Q 11. B**
- **The International Purple Fest, held annually in Goa, is a global event dedicated to celebrating diversity and promoting accessibility for persons with disabilities (PwDs).** Its primary aim is to foster a more inclusive and accessible society by:
 - **Promoting Inclusion:** The festival serves as a platform for dialogue, policy innovation, and cultural expression that recognizes PwDs as equal contributors to society.
 - **Showcasing Talent:** It highlights the talents and potential of persons with disabilities through various activities, including live performances, sports events (like blind football and para-olympics), art exhibitions, and cultural programmes.
 - **Raising Awareness:** The event focuses on generating empathy-based awareness about disability issues and promoting a shift in societal perception from seeing disability as a limitation to recognizing ability and contribution.
 - **Advancing Accessibility:** Key initiatives, such as the launch of the "Yes to Access" project and the "Disability Information Line," aim to improve physical and digital accessibility and ensure a barrier-free environment for PwDs.
 - **Hence, option (b) is the correct answer.**

- Q 12. B**
- **Objective of the Scheme:** The Vishwas Scheme (a temporary amnesty-like scheme) was launched by the Employees' Provident Fund Organisation (EPFO) to reduce the backlog of litigation related to delayed or non-payment of Employees' Provident Fund (EPF) dues by employers. It seeks to promote trust and voluntary compliance by offering rationalized and lower penal damages.
 - **Parent Body:** The Employees' Provident Fund Organisation (EPFO), which administers the Employees' Provident Funds and Miscellaneous Provisions Act, 1952, is the statutory body responsible for implementing the Vishwas Scheme.

- **Ministry:** The EPFO functions directly under the administrative control of the Ministry of Labour and Employment, Government of India. The scheme was launched by the Union Minister for Labour and Employment, Dr. Mansukh Mandaviya, while chairing the Central Board of Trustees (CBT) of the EPFO.
- Hence, option (b) is the correct answer.

- Q 13. C**
- The Energy Conservation Building Code (ECBC) was launched in May 2007 by the Bureau of Energy Efficiency (BEE), Ministry of Power. Its main objective is to establish minimum requirements for energy-efficient design and construction of buildings. India's two-thirds of the total building stock that will exist in 2030 are yet to be built. New buildings possess a great challenge to meeting their increasing energy demand. ECBC sets minimum energy efficiency levels for commercial buildings, locking in energy savings for years to come, retaining occupant comfort while combating climate change. **Hence statement 1 is not correct**
 - The ECBC applies to all buildings or building complexes that have a connected load of 100 kW or greater, or a contract demand of 120 kVA or greater and are used for commercial purposes. **It is applicable for both Government and private buildings.** The code does not apply to Equipment and portions of building systems that use energy primarily for manufacturing processes. **Hence statement 2 is correct.**
 - **ECBC addresses only the energy efficiency of buildings and not the water efficiency as such.** Water and other aspects are generally covered in green building rating systems. **Hence statement 3 is not correct.**

- Q 14. B**
- The World Health Organization's Air quality guidelines (AQG) serve as a global target for national, regional and city governments to work towards improving their citizen's health by reducing air pollution.
 - The WHO Air quality guidelines are a set of evidence-based recommendations of limit values for specific air pollutants developed to help countries achieve air quality that protects public health. The first release of the guidelines was in 1987. The 2021 update of the WHO air quality guidelines is in response to the real and continued threat of air pollution to public health. **The WHO Air quality guidelines recommend levels and interim targets for common air:**

Recommended 2021 AQG levels compared to 2005 air quality guidelines

Pollutant	Averaging Time	2005 AQGs	2021 AQGs
PM _{2.5} , µg/m ³	Annual	10	5
	24-hour ^a	25	15
PM ₁₀ , µg/m ³	Annual	20	15
	24-hour ^a	50	45
O ₃ , µg/m ³	Peak season ^b	-	60
	8-hour ^a	100	100
NO ₂ , µg/m ³	Annual	40	10
	24-hour ^a	-	25
SO ₂ , µg/m ³	24-hour ^a	20	40
CO, mg/m ³	24-hour ^a	-	4

- However, Carbon dioxide, lead and mercury are not included in the updated AQGs. **Hence, option (b) is the correct answer.**

Q 15. A Atmospheric components like aerosols (such as sulfate particles from volcanic eruptions or burning coal), lower-altitude clouds, and certain upper-atmospheric gases can contribute to Earth's cooling. Aerosols and lower clouds reflect sunlight back into space, while Black carbon deposition on ice has a heating effect in the atmosphere.

Cooling effects

- **Stratospheric water vapour reduction:** Methane oxidation in the stratosphere is a source of water vapor, a greenhouse gas. A reduction in stratospheric water vapor, possibly through chemical reactions mediated by halogens, leads to a cooling effect by reducing the absorption and re-radiation of heat. **Hence, point 1 is correct.**
- **Aerosols from phytoplankton (such as DMS — dimethyl sulfide):** Dimethyl sulfide (DMS) emitted by marine life is a precursor to sulfate aerosols in the atmosphere. These aerosols act as cloud condensation nuclei, leading to increased cloud formation and brighter clouds (higher albedo), which reflect more incoming solar radiation back to space, thus causing a cooling effect. **Hence, point 2 is correct.**
- **Sulfate aerosols:** Tiny particles formed from burning fossil fuels (especially coal) and volcanic eruptions, which reflect solar radiation back into space.
- **Lower-altitude clouds:** Thicker, lower clouds block incoming solar radiation, reflecting it away from the Earth's surface.
- **Volcanic aerosols:** Major volcanic eruptions release massive amounts of aerosols into the stratosphere, which can reflect sunlight and cause temporary global cooling.

Black carbon deposition on ice: Black carbon (soot) is a warming agent, not a cooling one. When deposited on ice or snow, it darkens the surface, reducing its albedo (reflectivity) and causing it to absorb more solar radiation, which leads to heating and accelerated melting. This effect contributes to global warming. **Hence, point 3 is not correct.**

- Q 16. A**
- Compostable plastics mean plastics that undergo degradation by biological processes. **During composting it yields CO₂, water, inorganic compounds and biomass at a rate consistent with other known compostable materials and does not leave visible, distinguishable or toxic residue. Hence, statement 2 is not correct.**
 - Compostable plastic also biodegrades, it is specifically designed and tested to be processed in either home or industrial composting facilities. Composting facilities enable specific conditions like temperature and moisture to turn the plastic into usable soil conditioner.
 - **These can be plantbased, but can also be petroleum-based as well.** BASF's Eco flex is an excellent example of a compostable polymer, which is partly petroleum-based but is compostable at industrial compost facilities. **Hence, statement 1 is correct.**

- Q 17. A**
- The byproducts of anaerobic digestion of organic materials are commonly referred to as '**biogas**' because of the biological nature of gas production. Biogas technology refers to the production of a combustible gas (called biogas) and a value added fertilizer (called slurry or sludge) by the anaerobic fermentation of organic material under certain controlled conditions.
 - In this process of conversion of energy from organic mass is mainly utilized in cell synthesis and formation of methane and carbon dioxide besides some part of it remains in the effluent. A simple flow chart may describe the three step process of bio-methanation are briefly described below:

- **Hydrolysis:** Hydrolysis is the first step in anaerobic degradation and also the rate limiting step. In this process, saprophytic bacteria converts complex organic compounds into less complex organic compounds, which are water-soluble. The hydrolysis of organic polymers such as polysaccharides, fats and proteins converts these polymers into smaller units, such as sugars, long-chain fatty acids and amino acids. This group of bacteria called as facultative anaerobes/microbes.
- **Acid forming Microbes or Acidogenesis:** The sugars, long-chain fatty acids and amino acids resulting from hydrolysis are used as substrates by a wide variety of bacterial generation of different fermentative organisms or by anaerobic oxidizers. The complex organic matters in liquid phase digestion convert the small water-soluble molecules by fermentation into acetate, carbon dioxide and hydrogen.
- In the acetogenesis step, the volatile fatty acids (such as propionic acid, butyric acid) and alcohols produced during acidogenesis are further converted by acetogenic bacteria into: **Acetate, Hydrogen, Carbon dioxide.**
 - This step is crucial because acetate, hydrogen, and carbon dioxide are the primary substrates required by methanogenic microorganisms. Acetogenesis also helps prevent the accumulation of VFAs, which can otherwise reduce pH and inhibit methane production.
- **Methane forming Microbes or Methanogenesis:** Acetate, carbon dioxide and molecular hydrogen can be directly utilized as a substrate by the group of anaerobic microorganisms. Methane can be synthesized via two different pathways, of which one involves acetate and the other molecular hydrogen. The estimations indicated that about 70% of the methane is produced from acetate and 30% comes from hydrogen. The Volatile Fatty acids (VFA) accumulation is to be avoided in the digester to produce the high gas content.
- Hence option (a) is the correct answer.

Q 18. A The Antarctic ozone hole is a temporary thinning of the ozone layer that occurs annually in the spring and is significantly larger and deeper than Arctic ozone depletion. The difference is due to unique meteorological conditions over Antarctica that create a more favorable environment for chemical ozone destruction. **Hence, statement 3 is not correct.**

The ozone hole develops and dissipates in a predictable cycle tied to the seasons of the Southern Hemisphere:

- Formation (Late Winter / Early Spring): The ozone hole begins to form around late August and reaches its maximum area and depth in late September or early October (austral spring). **Hence, statement 1 is correct.**
- Dissipation (Late Spring / Early Summer): The hole typically dissipates or closes by late November or early December, as temperatures warm and the atmospheric conditions change.

The Antarctic ozone hole forms and reaches its peak primarily during the Southern Hemisphere's spring months, which is from late August to early October/November.

It is caused by a combination of specific atmospheric conditions—namely, extremely cold temperatures that form polar stratospheric clouds—and human-produced chemicals like CFCs and halons. These conditions enable chemical reactions on the clouds that destroy ozone molecules, and strong polar winds trap the reactive chemicals, leading to a significant depletion of ozone. **Hence, statement 2 is correct.**

- Q 19. D**
- **Fuel cells** offer several benefits compared to other traditional power generation methods. Traditional power generation methods are based on combustion chemistry. Fuel cells in conjunction with renewable energy resources can provide a potential solution to futuristic energy needs.
 - **Clean energy:** Fuel cells produce electricity through an electrochemical reaction without combustion and therefore produce little or no harmful emissions such as greenhouse gases, particulate matter, or pollutants that contribute to air pollution and climate change.
 - **High efficiency:** Fuel cells can achieve high energy conversion efficiency, often higher than conventional combustion-based power generation methods. Depending on the type of fuel cell, efficiencies can range from 40% to 60% or even higher, which means that a major portion of the energy content in the fuel is changed into electricity, reducing wasted energy.
 - **Diverse fuel options:** Fuel cells can operate on a wide variety of fuels, such as hydrogen, natural gas, biogas, methanol, ethanol, and even renewable fuels like biomass or waste gases. This flexibility in fuel options allows for the utilization of various energy sources, including renewable and low-carbon fuels, which will reduce dependence on fossil fuels. **Hence, option (d) is the correct answer.**

- Q 20. C**
- Renewable diesel can be produced by several different technology pathways. Currently, commercial production facilities are using the hydrotreating pathway and fats, oils, and greases are the most common feedstocks. **It is made from fats and oils, such as soybean oil or canola oil, and is processed to be chemically the same as petroleum diesel. Hence, pair 2 is correctly matched.**
 - Renewable gasoline (also called green or drop-in gasoline) is a fuel produced from biomass sources through a variety of biological, thermal, and chemical processes. The fuel is chemically identical to petroleum gasoline. **It can be produced from various biomass sources. These include lipids (such as vegetable oils, animal fats, greases, and algae) and cellulosic material (such as crop residues, woody biomass, and dedicated energy crops). Hence, pair 1 is correctly matched.**
 - Sustainable aviation fuel (SAF), made from non-petroleum feedstocks, is an alternative fuel that reduces emissions from air transportation. SAF can be blended at different levels with limits of 10% to 50%, depending on the feedstock and how the fuel is produced. **SAF can be produced from non-petroleum-based renewable feedstocks including, but not limited to, the food and yard waste portion of municipal solid waste, woody biomass, fats/greases/oils, and other feedstocks. Hence, pair 3 is correctly matched.**

- Q 21. A**
- The Solid Waste Management (SWM) Rules, 2016, notified by the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India, replaced the Municipal Solid Wastes (Management and Handling) Rules, 2000.
 - These rules aim for a holistic approach to waste management, with a primary focus on waste segregation at the source, emphasizing the principles of Recovery, Reuse, and Recycle (3Rs), and treating landfilling as a last resort.
 - The SWM Rules, 2016 mandate a minimum of three waste streams for segregation at the source by every waste generator.
 - **Biodegradable waste** (e.g., kitchen waste, garden waste) must be separated for processing through composting or bio-methanation, preferably within the premises for bulk generators.
 - **Non-biodegradable waste** (e.g., plastic, paper, metal, glass, wood, sanitary pads, diapers) includes dry waste that can be recycled, incinerated for energy recovery, or sent to a sanitary

- landfill for inert material.
- **Domestic hazardous waste** (e.g., used batteries, e-waste, expired medicines, pesticide cans, CFL bulbs, broken mercury thermometers) must be stored separately in suitable bins and handed over to authorised collectors.
 - While other waste types like E-Waste and Industrial Waste are mentioned in the SWM Rules and related legislation, they are typically governed by their own specific management rules (e.g., E-Waste (Management) Rules, 2016; Construction and Demolition Waste Management Rules, 2016). However, the SWM Rules state that these specific waste streams should also be stored and disposed of separately as per their respective rules. The core, universally applicable segregation for all waste generators under SWM Rules is into the three primary streams mentioned above.
 - **Hence, option (a) is the correct answer.**

- Q 22. C**
- Vienna Convention: The Vienna Convention for the Protection of the Ozone Layer, adopted in 1985, is a framework treaty that established international cooperation to protect the ozone layer. It requires countries to cooperate by conducting research, exchanging information, and adopting measures to prevent activities that harm the ozone layer, but it does not include specific, legally binding targets for controlling ozone-depleting substances.
 - Montreal Protocol: Adopted under the Vienna Convention, this landmark agreement established binding, specific, and time-bound obligations to phase out the production and consumption of nearly 100 manufactured ozone-depleting substances (ODSs) such as chlorofluorocarbons (CFCs) and halons.
 - Kigali Amendment: This is an amendment to the Montreal Protocol that commits parties to phase down the production and consumption of hydrofluorocarbons (HFCs). While HFCs do not deplete the ozone layer, they are potent greenhouse gases used as replacements for ODSs, and their control helps protect the climate.
 - Cartagena Protocol: The Cartagena Protocol on Biosafety to the Convention on Biological Diversity is an international agreement on biosafety as a supplement to the Convention on Biological Diversity (CBD) effective since 2003. The Biosafety Protocol seeks to protect biological diversity from the potential risks posed by genetically modified organisms resulting from modern biotechnology.
 - **Hence, option (c) is the correct answer.**

- Q 23. C**
- The Bio-Medical Waste Management Rules, 2016, notified by the Ministry of Environment, Forest & Climate Change in India, superseded the 1998 rules. Their main objective is to ensure the environmentally sound management of biomedical waste to protect human health and the environment.

These rules apply to all persons who generate, collect, receive, store, transport, treat, dispose, or handle bio-medical waste in any form, including hospitals, nursing homes, clinics, dispensaries, pathological laboratories, blood banks, vaccination camps, and other healthcare activities.

key features and provisions of the Bio-Medical Waste Management Rules, 2016:

Simplified Waste Categorization and Segregation

- **The Rules require the segregation of biomedical waste into four categories at the point of generation within each healthcare unit using a specific colour-coding system (yellow, red, white, and blue). Hence, statement 1 is correct.**

- very occupier (of a healthcare facility) or operator (of a Common Bio-medical Waste Treatment Facility - CBWTF) handling bio-medical waste, irrespective of the quantity, must obtain authorization from the State Pollution Control Board (SPCB) or Pollution Control Committee (PCC).

Duties of Healthcare Facilities (Occupiers)

- On-site Pre-treatment: Mandatory pre-treatment (disinfection/sterilization) of laboratory waste, microbiological waste, blood samples, and blood bags.
- Storage Limit: Untreated bio-medical waste shall not be stored beyond a period of 48 hours.
- Phasing Out Chlorinated Plastics: Mandates phasing out the use of chlorinated plastic bags, gloves, and blood bags.
- Training & Immunization: Compulsory annual training for all healthcare workers involved in handling BMW and immunization against diseases like Hepatitis B and Tetanus.
- **Bar-Code System: Establish a bar-code system for bags/containers containing biomedical waste for disposal. Hence, statement 2 is correct.**

The Rules stipulate that every occupier (healthcare facility) must ensure treatment and disposal of generated bio-medical waste through a common bio-medical waste treatment facility (CBWTF) if one is available within a distance of 75 km. **Deep burial as a method of disposal is generally discouraged and is only permitted in remote or rural areas where a CBWTF is not accessible, subject to specific guidelines and approval. Hence, statement 3 is correct.**

- Q 24. B**
- The Montreal Protocol is a global agreement signed in 1987 to protect the Earth's ozone layer by phasing out the production and consumption of ozone-depleting chemicals, such as those used in refrigerators and aerosols. The Montreal Protocol is the first UN treaty to achieve universal ratification by all 198 UN member states. **Hence, statement 1 is correct.**
 - It is considered a landmark success in international environmental cooperation, achieving universal ratification and a phased reduction of these substances based on scientific evidence and technological information.
 - The Protocol initially targeted substances like chlorofluorocarbons (CFCs) and halons that directly deplete the ozone layer. Hydrofluorocarbons (HFCs) were later introduced as transitional substitutes for these substances because HFCs do not deplete the ozone layer. The phase-down of HFCs was addressed later through the Kigali Amendment in 2016, primarily because they are potent greenhouse gases, not because they are ozone-depleting chemicals. **Hence, statement 2 is not correct.**
 - The Protocol sets out a mandatory timetable to phase down ozone-depleting substances (ODS) in a stepwise manner, with different, more relaxed timelines for developing countries (referred to as "Article 5 countries") compared to developed countries. This acknowledges the principle of common but differentiated responsibilities. **Hence, statement 3 is correct.**
 -

- Q 25. A**
- **Polyhydroxyalkanoates (PHAs) are a class of natural materials that exist in nature for over millions of years.** These materials are both bio-based and biodegradable, similar to other natural materials such as cellulose, proteins and starch. **PHAs are produced by an extensive variety of microorganisms through bacterial fermentation. During fermentation, bacteria convert**

different types of feedstock into a product. In this case, the microbes produce PHA, a natural polymer. Hence, option (a) is the correct answer.

- Polylactic acid (PLA) is defined as a biodegradable, thermoplastic polymer derived from renewable resources, such as corn starch or sugarcane, and is synthesized through the fermentation of glucose to produce lactic acid, which is then polymerized. PLA is known for its eco-compatibility and versatility, finding applications in areas like food packaging, medical sutures, and 3D printing.
- Thermoplastic starch (TPS) is a biodegradable, bio-based plastic made from starch that is used as an alternative to petroleum-based plastics.
- Cellophane is Cellulose-based Plastics, derived from cellulose, a natural polymer found in plant cell walls.

Q 26. A • The Union Cabinet has approved the National Green Hydrogen Mission with an outlay of Rs. 19,744 crore up to FY 2029-30. The Strategic Interventions for Green Hydrogen Transition (SIGHT) programme is a major financial measure under the Mission, with an outlay of Rs. 17,490 crore.

- The programme proposes two distinct financial incentive mechanisms to support domestic manufacturing of electrolyzers and production of Green Hydrogen. These incentives are aimed at enabling rapid scale-up, technology development and cost reduction. Hence, option (a) is the correct answer,
- There could be several modes for the implementation of the 'Incentive Scheme for Green Hydrogen Production'. These are presently identified as follows:
 - Mode 1: Bidding on least incentive demanded over the three-year period, through a competitive selection process.
 - Mode 2: Aggregation of demand and calling for bids for production and supply of Green Hydrogen and its derivatives at the lowest cost through a competitive selection process.

Q 27. A • Some provisions of Noise Pollution (Regulation and Control) Rules, 2000:

- The State Government may categorize the areas into industrial, commercial, residential or silence areas/zones for the purpose of implementation of noise standards for different areas. Hence, option (a) is the correct answer.

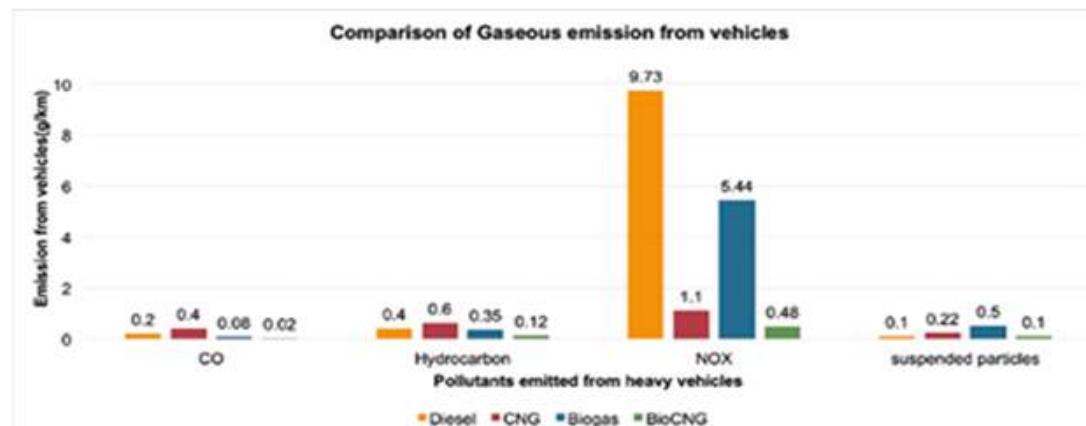
SCHEDULE (See rule 3(1) and 4(1))			
Ambient Air Quality Standards in respect of Noise		Limits in dB(A) Log *	
Area Code	Category of Area Zone	Day Time	Night Time
(A)	Industrial area	70	70
(B)	Commercial area	65	55
(C)	Residential area	60	45
(D)	Silence Zone	50	40

- The noise levels in any area/zone shall not exceed the ambient air quality standards in respect of noise as specified in the Schedule.
- The State Government shall take measures for abatement of noise including noise emanating from vehicular movements and ensure that the existing noise levels do not exceed the ambient air quality standards specified under these rules.
- An area comprising not less than 100 metres around hospitals, educational institutions and courts may be declared as silence area/zone for the purpose of these rules.

- A person may, if the noise level exceeds the ambient noise standards by 10 dB(A) or more given in the corresponding columns against any area/zone, make a complaint to the authority.

- Q 28.A**
- CNG stands for ‘compressed natural gas’. Bio-CNG is a renewable fuel obtained by purifying biogas – in contrast to CNG, a non-renewable source of energy. Biogas is processed to get 95% pure methane gas. Biogas is produced when microbes break down organic matter like food, crop residue, waste water, etc. **Hence statement 2 is not correct.**
 - Biogas is produced through **anaerobic decomposition of biomass**.
 - Since biogas contains 55 to 60 per cent methane, 40 to 45 per cent carbon dioxide (CO₂) and trace amounts of hydrogen sulphide.
 - The second process involves purifying the gas to remove carbon dioxide and hydrogen sulphide gases to prepare CBG.
 - Its solid by-products can be **used as bio-manure**.
 - **It is a rich source of silica** that not only aids in the growth and yield of crops but also bestows immunity against many diseases and prevents toxic material uptake by plants such as **arsenic, cadmium, lead and other heavy metals**.
 - It can thus help reduce the **requirement of chemical fertilisers**.
 - **The other by-product is CO₂**. It can be tapped while purifying the biogas and used to produce liquid or solid CO₂, which have high demand for food preservation or to be used in fire extinguishers.
 - The calorific value of Bio-CNG is about 52,000 kilojoules (kJ) per kg, which is 167 % higher than that of biogas. **Hence statement 1 is not correct.**

BENEFITS OF USING BIO-CNG COMPARED TO OTHER FUELS



BIO-CNG LOWEST IN TERMS OF EMISSIONS. MANY TIMES CLEANER WHEN COMPARED TO CNG WHICH IS FOSSIL BASED

- **Hence statement 3 is correct.**

Q 29. B The Congress is organised by the International Union for Conservation of Nature (IUCN) to strengthen global environmental governance and set the agenda for conservation. The IUCN World Conservation Congress is where the world comes together to set priorities and drive conservation and sustainable development action. **Hence, statement 1 is correct.**

IUCN's 1400+ government, civil society and Indigenous peoples' Member organisations vote on major issues to help guide humanity's relationship with our planet.

The Congress is also the largest marketplace for conservation and sustainable development science, practice and policy. Scientists, policy experts, business leaders and professionals from around the globe share their experience, innovation and latest research. **Hence, statement 2 is correct.**

IUCN's unique convening power of state and non-state actors together gives Congress a powerful mandate to set the nature conservation agenda for decades to come. International Union for Conservation of Nature (IUCN) World Conservation Congress 2025 concluded in Abu Dhabi, UAE. **Hence, statement 3 is not correct.**

Key Resolutions at Member's Assembly

- Abu Dhabi Call to Action: Accelerate action across five key areas – reaffirming nature as foundation of well-being, strengthening multilateralism, ensuring justice and inclusion, advancing knowledge and innovation, and scaling up resources for nature and climate action.
- New Members: Over 100 new members including six states – Armenia, Tajikistan, Marshall Islands, Gabon, Tuvalu, and Zimbabwe.
- First-ever Policy on Synthetic Biology and Nature Conservation: Synthetic biology may carry both substantial benefits (e.g. to restore lost genetic diversity or to locally eradicate invasive alien species) and significant risks (e.g. unintended ecological cascades), necessitating balanced policy.
- Crime of Ecocide: Recognizes ecocide (deliberate environmental harm) as international crime under the International Criminal Court.

Q 30. B • **PAT scheme** as a market-based mechanism, under National Mission for Enhanced Energy Efficiency (NMEEE) is to enhance cost effectiveness through certification of excess energy savings in energy intensive industries that can be traded. The scheme seeks to reduce the specific energy consumption (SEC), i.e. energy used per unit of production in energy intensive large industries.

• Under this scheme, an Energy Audit is done to verify the baseline data (current level of efficiency) and thereafter energy saving targets are given. **Energy Saving Certificates (ESCert) are issued to those plants that have achieved excess energy savings over their targets.** Units that are unable to meet the targets either through their own actions or through purchase of ESCerts are liable to financial penalty under **the Energy Conservation Act, 2001.** **Hence, statement 1 is correct.**

• After Issuance of ESCerts DCs are required to register with the Registry as Eligible Entity before registering with the power exchanges for trading of ESCerts and book keeping of ESCerts. **The Trading of ESCerts takes place on the Power Exchange platform.**

• **The Bureau of Energy Efficiency (BEE) is the administrator for the Energy Savings Certificates (ESCert) mechanism.** In this role, BEE co-ordinates with designated consumers, provides guidance, and handles operational tasks related to the trading of ESCerts, which are tradable instruments created under the Perform, Achieve and Trade (PAT) scheme to encourage energy savings. **Hence, statement 2 is correct.**

• **One Energy Saving Certificate is equivalent to 1 metric Tonne of Oil Equivalent (MTOE).** **Hence, statement 3 is not correct.**

- Q 31. D**
- The G20 presidency follows a troika system. The Presidency for 2024 was held by Brazil, and the presidency for 2025 was passed to South Africa. The host city for the 2025 Summit is Johannesburg. **Hence, statement 1 is correct.**
 - The theme chosen by South Africa for its 2025 G20 Presidency is “Solidarity, Equality and Sustainability”, focusing on collaborative action toward shared global progress. **Hence, statement 2 is correct.**
 - While India's primary 2023 theme was 'Vasudhaiva Kutumbakam' (One Earth, One Family, One Future), one of the key focus areas and priorities under its security and transnational crime agenda was strengthening international cooperation in Countering the Drug-Terror Nexus and illicit financial flows. **Hence, statement 3 is correct.**

- Q 32. B**
- **Gokul Jalashay, also known as Gokul Reservoir, is a designated Ramsar site in Buxar district, Bihar.** It is an oxbow lake on the southern edge of the Ganges River, important for its role in flood control, as a habitat for over 50 bird species, and for supporting local livelihoods through fishing and irrigation. **Hence, pair 1 is correctly matched.**
 - **Udaipur Jheel is a Ramsar site in the West Champaran district of Bihar, India.** It is an oxbow lake located within the Udaipur Wildlife Sanctuary and is an important wintering ground for migratory birds. **Hence, pair 2 is not correctly matched.**
 - **Gogabael Lake in Katihar, Bihar,** is India's 94th Ramsar site and the state's first community-managed wetland. This oxbow lake, formed by the Ganga and Mahananda rivers, is a vital habitat for migratory birds and a critical area for local communities. Its designation highlights India's commitment to wetland conservation and strengthens the country's position in the Ramsar list. **Hence, pair 3 is not correctly matched.**
 - **Udhwa Lake is a Ramsar site located in the Sahibganj district of Jharkhand, India.** It was designated as a Ramsar site in early 2025, making it the first for the state of Jharkhand. The site consists of two interconnected wetlands, Pataura and Barhel, linked to the Ganga River and is a crucial habitat for a variety of bird species. **Hence, pair 4 is correctly matched.**

- Q 33. D**
- **Bamako Convention**
 - **The Bamako Convention is a treaty of African nations prohibiting the import into Africa of any hazardous (including radioactive) waste. The convention came into force in 1998.**
 - The scope of the Convention is confined to hazardous wastes, though not wastes from ship discharges covered by another Convention. Hazardous substances banned, cancelled or refused registration by government regulatory action for health or environmental reasons, are defined as hazardous wastes under the Convention. Radioactive wastes are covered also by the Convention (art. 2). Parties agree to enact legislation identifying and categorising hazardous wastes not already listed in the Convention (art. 3).
 - **Purpose of the Convention**
 - To prohibit the import of all hazardous and radioactive wastes into the African continent for any reason;
 - To minimize and control transboundary movements of hazardous wastes within the African continent.
 - To prohibit all ocean and inland water dumping or incineration of hazardous wastes.
 - To ensure that disposal of wastes is conducted in an “environmentally sound manner”.

- To promote cleaner production over the pursuit of a permissible emissions approach based on assimilative capacity assumptions
- To establish the precautionary principle.
- Hence, option (d) is the correct answer.

Q 34. B • **Puga Geothermal Energy Project, Ladakh:** Owing to the geographical disposition of Ladakh, and the abundance of hot springs and rivers in the Puga Valley, this region is ideal for harnessing geothermal energy. Once completed, the project will be India's first geothermal power plant. **Hence pair 1 is correctly matched.**

- **Bhadla solar park, Rajasthan:** Bhadla solar park is a 2.25GW solar complex being developed in Bhadla village in Jodhpur district of Rajasthan. **Hence pair 2 is not correctly matched.**
- **Brahmanvel Wind Farm, Maharashtra:** The 528MW Brahmanvel wind farm, which is one of India's largest wind power production facilities, is located in Dhule district of Maharashtra. Hence pair 3 is correctly matched.
- **Gobar-Dhan Bio-CNG Plant, Madhya Pradesh:** The Gobar-Dhan Plant, Asia's largest Bio-CNG plant, is located in Indore. The plant has a capacity to treat 550 tonnes per day of segregated wet organic waste. It is expected to produce around 17,000 kg per day of CNG, and 100 tonnes per day of organic compost. **Hence pair 4 is correctly matched.**
- **Simhadri Floating Solar PV Plant, Telangana:** The Simhadri Floating Solar PV Plant is located in the Simhadri thermal station in Visakhapatnam. It is one of the largest floating solar photovoltaic (PV) power plants in the country. **Hence pair 5 is not correctly matched.**

Q 35. C • **Public Consultation in EIA:** It is a process by which the concerns of local affected persons and other stakeholders in the environmental impacts of the project or activity design are ascertained.

- Category of Projects: It is required for usually all Category A and Category B1 projects.
- Two Components of Public Consultation:
 - A public hearing at the site or in its close proximity.
 - Obtaining written responses from concerned stakeholders
- Conducting Agency: State Pollution Control Board (SPCB) or Union Territory Pollution Control Committee (UTPCC) The proceedings must be sent to the concerned regulatory authority within 45 days of receiving the applicant's request.
- Public Consultation is **mandatory for all Category A and B1 projects, except for the following:**
 - **Modernisation of irrigation projects**
 - Projects located within approved industrial estates or parks that are not prohibited there.
 - Expansion of roads and highways (Schedule 7(f)) that do not require new land acquisition.
 - **All building, construction, area-development projects, and townships.**
 - All Category B2 projects.
 - Projects related to national defence, security, or other strategic considerations as identified by the Central Government.
 - **Recently, Ministry of Environment, Forest and Climate Change (MoEFCC) exempted mining projects involving Atomic, Critical, and Strategic minerals (like Rare Earth**

Elements) from Public Consultation under the Environmental Impact Assessment (EIA), 2006.

- Hence, option (c) is the correct answer.

Q 36. D Basel Convention was adopted in 1989 by the Conference of Plenipotentiaries in Basel, Switzerland, the “Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal”, generally known as the Basel Convention, came into force in 1992. **Hence, statement 1 is correct.**

It establishes a "prior informed consent" (PIC) system, requiring written consent from importing countries for the movement and disposal of hazardous waste, and includes amendments to address issues like e-waste and plastic waste. India is a party to the convention. This statement is correct. India ratified the Convention in June 1992, and it entered into force for India on September 22, 1992. **Hence, statement 2 is correct.**

Basel Convention is the only global legally binding instrument to specifically address plastic waste. This statement is incorrect. In 2019, the Basel Convention was amended to include certain plastic wastes under a legally binding framework (the Prior Informed Consent procedure), making the global trade in plastic waste more transparent and better regulated. The Convention itself is the most comprehensive global environmental agreement on hazardous wastes, which now includes plastic waste as a category of "other wastes" requiring special consideration. **Hence, statement 3 is correct.**

Q 37. C UNFCCC COP30 is the United Nations Climate Change Conference took place in Belém, Brazil from 10 to 21 November 2025. UN Climate Change Conferences (or COPs) take place every year, and are the world's only multilateral decision-making forum on climate change that brings together almost every country on Earth.

COP30 brings together world leaders and negotiators from the member states (or Parties) of the UN Framework Convention on Climate Change (UNFCCC) to further global progress, with business leaders, young people, climate scientists, Indigenous Peoples, and civil society sharing insights and best practices to strengthen global, collective and inclusive climate action.

Officially, COP30 stands for the 30th meeting of the Conference of the Parties (COP) to the UN Framework Convention on Climate Change (UNFCCC), a landmark international treaty agreed in 1992, and parent treaty to the 2015 Paris Agreement.

Hence, option (c) is the correct answer.

Q 38. C • **Cloud seeding techniques** enhance precipitation by releasing agents like silver iodide, salt, or dry ice into clouds, acting as nuclei for water to condense or freeze, causing rain or snow, using methods like aircraft dispersal (flares from below or drops from above), ground generators, or drones, with main types being static (cold clouds), dynamic (boosting updrafts), and hygroscopic (warm clouds) to manage water, fight fires, or clear pollution.

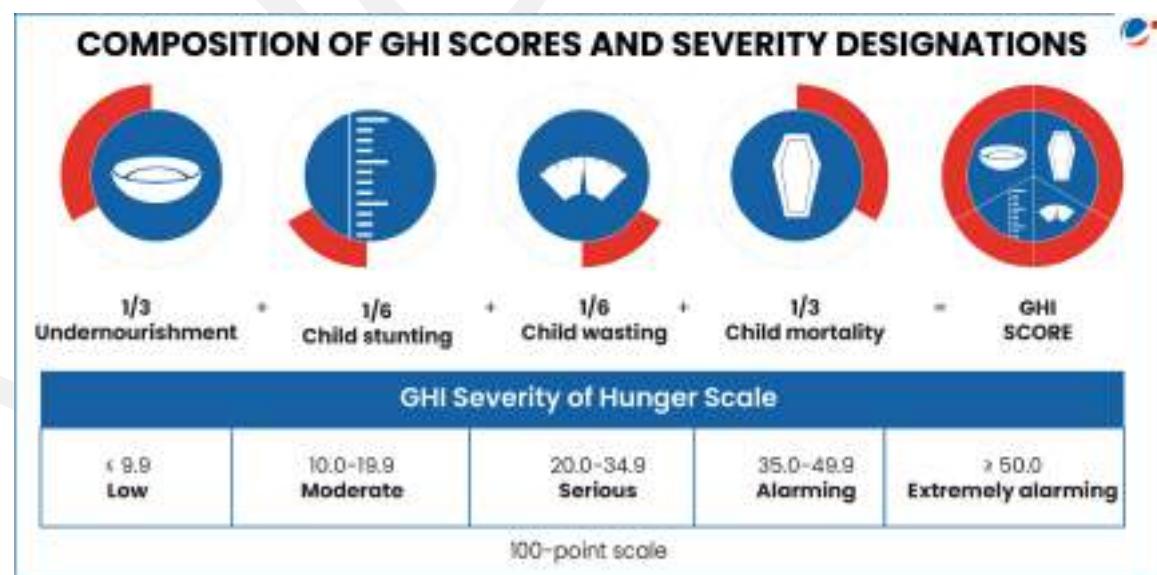
- **Main Cloud Seeding Agents**

- Silver iodide is widely used as an ice-nucleating agent in cold clouds because its crystalline structure is similar to that of natural ice, which encourages the formation of ice crystals.
- Sodium chloride(common salt) is a hygroscopic material, meaning it attracts and absorbs water. It is used in warm clouds to promote the growth of water droplets by providing condensation nuclei.
- Dry ice (solid carbon dioxide) is also used in cloud seeding. It rapidly cools the air to below freezing temperatures, causing water vapor to condense and form ice crystals.

- Potassium permanganate is not a substance commonly used in cloud seeding. It is generally used as a strong oxidizing agent, for water treatment, and in medical applications. It does not have the properties necessary to act as an effective cloud condensation or ice nucleus in cloud seeding operations.
- Hence, option (c) is the correct answer.

Q 39. C • **Recent Context**

- Global Hunger Index (GHI), 2025 ranks India under 'serious' category.
- Key Findings of the report
 - India's Position: India is ranked 102nd among the 123 countries assessed with a GHI score of 25.8, which is classified as serious.
 - Child Nutrition Crisis: 1 in 3 Indian children is stunted. Undernourishment affects 172 million people, 13.5 million more than in 2016.
- **About Global Hunger Index (GHI)**
 - Index has been released by Irish humanitarian organization 'Concern Worldwide' and German aid agency 'Welthungerhilfe' (with FAO, UNICEF, WHO, IFPRI).
 - Purpose of Index is to track hunger globally using nutrition & mortality indicators.
- **Each country's GHI score is calculated based on a formula that combines four indicators:**
 - Undernourishment (Insufficient caloric intake);
 - Child stunting (Children with low height under age 5);
 - Child wasting: (Children with low weight for their height under age 5);
 - Child mortality: (Children who die before their fifth birthday).



- Indicator 4 in the list (Maternal mortality): Not Used
- Hence, option (c) is the correct answer.

Q 40. C • **The Global Alliance to Eliminate Lead Paint (Lead Paint Alliance) is a voluntary partnership formed by the United Nations Environment Programme (UNEP) and the World Health Organization (WHO) to prevent exposure to lead through promoting the phase-out of paints containing lead. Hence, statement 1 is correct.**

- The Global Alliance to Eliminate Lead Paint is a voluntary collaborative initiative to focus and catalyze the efforts of a diverse range of stakeholders to achieve international **goals to prevent children's exposure to lead from paint and to minimize occupational exposures to lead paint**. **Hence, statement 2 is correct.**
- Lead is poisonous, especially harmful to children – Children are vulnerable because they absorb more lead – Children's exposure is through paint particles, dust and soil. Malnutrition exacerbates the impact, can cause loss of IQ, learning and developmental disabilities, and death.

Q 41. B • Key Highlights of India's New and Renewable Energy Sector

- Record RE buildout: India added 29.52 GW renewable capacity in FY 2024–25, taking total RE to 234.24 GW (excluding 8.78 GW of Nuclear capacity) as of August 12, 2025, (up from 198.75 GW in FY 2023–24) and **moving firmly toward the Panchamrita goal of 500 GW non-fossil energy capacity by 2030**. **Hence, statement 3 is not correct.**
- Installed Solar capacity crosses 100 GW: 116.24 GW solar as of August 12, 2025 (up from 2.82 GW in 2014). **Solar energy alone accounts for 48% of India's total RE capacity**. **Hence, statement 1 is correct.**
- Large Hydro capacity stands at 49.62 GW and Small Hydro stands at 5.10 GW, as of August 12, 2025.
- Wind energy capacity: 51.67 GW as of August 12, 2025 (up from 21.04 GW in 2014).
- Biopower generation capacity has increased to 11.59 GW over the last 11 years.
- Over the past decade, India's energy landscape has undergone a transformation of historic scale and speed. From being a net importer heavily dependent on fossil fuels, the country has emerged as a global clean energy leader — **ranking 4th globally in Renewable Energy (RE) Installed Capacity, 3rd in solar, 4th in wind, and holding the world's fastest-growing renewable energy program**. **Hence, statement 2 is correct.**

Q 42. A • Persistent organic pollutants (POPs) are a class of hazardous chemicals that resist natural decomposition and persist in the environment for extended periods. This property enables POPs to contaminate remote areas in the world through air and water currents. Even regions with minimal or no industrial activity are not immune to their impact. Persistent organic pollutants include pesticides, industrial chemicals and hazardous by-products of combustion.

- **These pollutants can move across vast distances from the southern hemisphere to the northern hemisphere by what is called the “grasshopper effect”.** This means that they evaporate with warm air and return to earth with rain and snow in the colder areas of the globe.
- The Arctic is suffering from both local and global pollution. Plastics and chemicals produced all over the world deposit and accumulate in the Arctic. **Hence, option (a) is the correct answer.**

Q 43. B The World Meteorological Organization (WMO)'s 2024 report states that Asia experienced its warmest or second-warmest year on record, with an average temperature of 1.04°C above the 1991–2020 average. This record heat was accompanied by widespread and prolonged heatwaves, record sea surface temperatures, significant glacier melt in the Himalayas and Tian Shan, and increased extreme weather like floods, droughts, and tropical cyclones.

Key findings from the "State of the Climate in Asia 2024" report

- Record-breaking temperatures: Asia's 2024 temperature was 1.04°C above the 1991–2020 average, marking it as one of the warmest years on record.

- Warming trend: The continent is warming at a rate nearly twice the global average.
- Heatwaves: Widespread and prolonged heatwaves were a major feature, with extreme heat causing over 450 deaths in India alone and impacting marine environments as well.
- Extreme weather: The report documented a rise in extreme weather events, including floods, droughts, and destructive tropical cyclones.
- Cryosphere: Glaciers in the central Himalayas and Tian Shan saw accelerated mass loss, increasing the risk of Glacial Lake Outburst Floods (GLOFs) and threatening long-term water security.
- Sea level rise: Sea level rise in the Indian and Pacific Oceans exceeded the global average, increasing risks for low-lying coastal areas.

Hence, option (b) is the correct answer.

- Q 44. D**
- **Underground coal gasification (UCG) is the in-situ process of converting hydrocarbon materials into synthesis gas.** Underground coal gasification is sometimes referred to as in-situ coal gasification. The syngas produced typically contains a mixture of Methane, Hydrogen, Carbon monoxide, Carbon dioxide. **Hence, statement 1 is correct.**
 - UCG process involved injecting steam and air (or oxygen) into the coal seam which is then ignited to initiate gasification. Typically temperatures above 1000°C are required for the gasification to proceed. **Underground Coal Gasification offers a significant advantage by providing access to coal resources that are economically unviable through traditional mining methods.** Hence, **statement 2 is correct.**
 - One of the most significant environmental risks related to underground coal gasification (UCG) is groundwater contamination, which could potentially occur after process shutdown. **In underground gasification, there is no need for above ground disposal of coal combustion wastes such as coal ash. However, these pollutants are left behind in the coal seam, where they can leach out into surrounding groundwater.** Hence, **statement 3 is correct.**

- Q 45. A**
- Recently, Saudi Arabia has abolished the Kafala system.
 - It is expected to benefit around 13 million foreign workers, including over 2.6 million Indians.
 - **About Kafala System**
 - It is a worker sponsorship programme which gave employers full control over their employees' legal status, residencies, when or if they could leave the country, seeks legal help, or even changes jobs.
 - The system tied each sponsor or 'Kafeel' to a migrant worker.
 - Concern associated with System: It is criticized as modern day slavery as Employers started to abuse this system to exploit employees. E.g., they would restrict their movement, seize passport, etc.
 - **Hence, option (a) is the correct answer.**

- Q 46. B**
- **"Critically Polluted Area" means the area where pollution level has reached or likely to reach to the critical level and which has been identified as such by the Central Government or Central Pollution Control Board or a State Pollution Control Board.**

- During 2009-10, Central Pollution Control Board (CPCB) conducted a comprehensive environmental assessment of 88 identified industrial clusters across the country and rated them on the concept of Comprehensive Environmental Pollution Index (CEPI). Out of these 88 industrial clusters, 43 industrial clusters had CEPI scores more than 70 and were identified as Critically Polluted Areas (CPAs) and 32 industrial clusters with CEPI score between 60-70 were considered as severely polluted areas (SPAs). To assess the environmental quality in the Polluted Industrial Areas (PIAs), monitoring is carried out by CPCB through recognized environmental laboratories periodically. **"Critically Polluted Areas" are declared under The Environment (Protection) Act, 1986. Hence, option (b) is the correct answer.**

- Q 47. A**
- White Category industries are those considered to have minimal or negligible pollution potential, such as biscuit tray manufacturing, etc.
 - Ministry of Environment stated that industrial plants scoring up to 20 on the pollution index will no longer be subject to the provisions under sub-section (1) of section 21 of the Air (Prevention and Control of Pollution) Act, 1981**, provided they inform the respective State Pollution Control Boards or Pollution Control Committees in writing.
 - Industrial Sectors having Pollution Index score of 60 and above - Red category
 - Industrial Sectors having Pollution Index score of 41 to 59 – Orange category
 - Industrial Sectors having Pollution Index score of 21 to 40 – Green category
 - Industrial Sectors having Pollution Index score incl.&upto 20 - White category
 - The Center has announced that industries categorised under the 'White Category' by the Central Pollution Control Board (CPCB) will no longer require prior approval from state pollution control boards to establish and operate.**
 - These permissions are known officially as 'Consent To Establish' (CTE) and 'Consent To Operate' (CTO). The consent to establish is granted by the state pollution control board. **Hence, Statement 1 is correct and Statement 2 is not correct.**

- Q 48. A**
- Antarctic Research Stations: The names Maitri and Bharti (sometimes spelled Bharati) refer to India's permanent and operational scientific research bases in Antarctica. These stations are managed by the National Centre for Polar and Ocean Research (NCPOR) under the Ministry of Earth Sciences.
 - Bharti (2012):** This is India's newest and most modern operational research station, commissioned in 2012. It is located near the Larsemann Hills and focuses primarily on oceanographic studies and understanding the Indian subcontinent's geological history.
 - Maitri (1989):** This is India's second permanent research station, established in 1989. It is located in the Schirmacher Oasis and focuses on earth sciences, glaciology, and meteorology.
 - Maitri II: This name refers to the new, fourth research station that the Government of India is building.**
 - It is intended to replace the aging Maitri station (which has surpassed its design life) with a larger, modern, and environmentally friendly facility, often referred to as a "green research base." The project was recently approved, and the new station, Maitri II, is expected to be operational by 2029.
 - India's Antarctic Bases History:
 - Dakshin Gangotri (1983): Decommissioned in 1990.
 - Maitri (1989): Currently operational.

- Bharti (2012): Currently operational.
- Maitri II (Upcoming): Planned to replace Maitri.
- Therefore, both Maitri II (the proposed replacement station) and Bharti (an existing station) are part of India's research stations in Antarctica. **Hence, option (a) is the correct answer.**

Q 49. A • The Global River Cities Alliance (GRCA) is an international network for sustainable river management, launched at the 2023 UN Climate Change Conference (COP28). Modeled on India's existing River Cities Alliance, it fosters collaboration between cities to share expertise, address issues like pollution and climate change, and promote river conservation and urban development. **Hence, statement 2 is not correct.**

- The alliance was initiated by India's National Mission for Clean Ganga (NMCG) and the National Institute of Urban Affairs (NIUA), with support from countries like Egypt, the Netherlands, and Australia. **Hence, statement 1 is correct.**

• **Objectives and functions**

- Promote river conservation: Work together to develop strategies that balance economic growth with environmental protection.
- Manage water sustainably: Address challenges like pollution, water security, and climate resilience, including floods and droughts.
- Share knowledge and best practices: Create a platform for cities to exchange expertise and learn from each other's experiences.
- Foster collaboration: Encourage partnerships between governments, cities, and financial institutions to support sustainable river initiatives.

Q 50. B • **The Carbon Border Adjustment Mechanism (CBAM)** is the EU's tool to put a fair price on carbon emitted during the production of carbon-intensive goods that are entering the EU, and to encourage cleaner industrial production in non-EU countries. **Hence, option (b) is the correct answer.**

- CBAM will apply in its definitive regime from 2026, with a transitional phase of 2023 to 2025. This gradual introduction is aligned with the phase-out of free allowances under the EU Emissions Trading System (ETS) to support the decarbonisation of EU industry.

• **CBAM definitive regime (from 2026)**

- EU importers of goods covered by CBAM will register with national authorities where they can also buy CBAM certificates. The price of the certificates will be calculated depending on the weekly average auction price of EU ETS allowances expressed in €/tonne of CO₂ emitted.
- EU importers will declare the emissions embedded in their imports and surrender the corresponding number of certificates each year.
- If importers can prove that a carbon price has already been paid during the production of the imported goods, the corresponding amount can be deducted.

Q 51. D • **The term Precision Biotherapeutics refers to a class of medical treatments that are highly specific, designed to target the underlying cause of a disease at the molecular, cellular, or**

genetic level. They focus on delivering the right treatment to the right patient at the right time, based on unique individual characteristics.

- **CAR-T cell therapy:** Genetically engineers a patient's own T-cells (a type of white blood cell) to specifically recognize and kill cancer cells that express a particular antigen (like CD19). This is highly personalized and targeted.
- **Monoclonal antibodies (mAbs):** These are laboratory-made antibodies designed to precisely target a single, specific antigen (a protein or molecule) on the surface of a cell (e.g., a tumor cell or an inflammatory mediator).
- **mRNA vaccines:** Unlike traditional vaccines, mRNA vaccines deliver genetic instructions (in the form of messenger RNA) to the body's cells to produce a specific, harmless viral protein (antigen). This antigen then trains the immune system to recognize and attack the virus. They are highly specific to the target antigen.
- **CRISPR-Cas9 gene correction:** This revolutionary technology allows for the precise editing of DNA sequences in a cell's genome (e.g., to fix a faulty gene causing a disease like sickle cell anemia, as seen with Casgevy). It is the epitome of molecular precision.
- Hence, all four options listed are considered examples of precision biotherapeutics because they target specific biological pathways or genetic instructions with high accuracy.

Q 52. B • The fundamental principle behind all highly accurate clocks, including quantum clocks, is the measurement of a constant, periodic physical process.

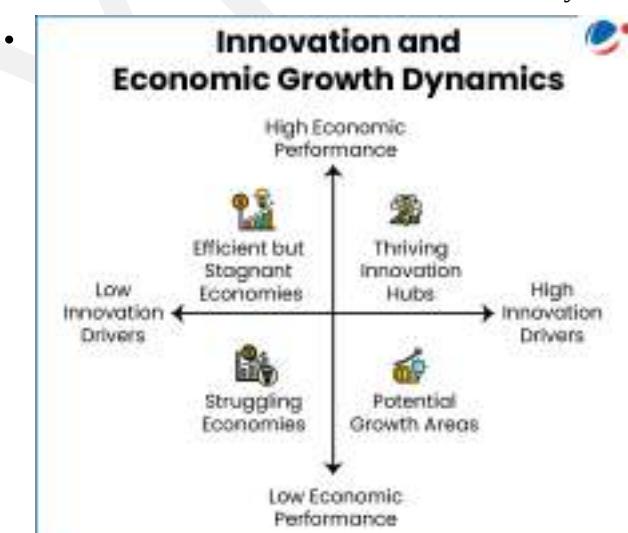
- A modern quantum clock (often called an optical clock) uses atoms (such as Strontium or Ytterbium) that are laser-cooled and trapped.
- **The "tick" of the clock is the frequency of the light (usually visible or near-infrared, hence "optical") required to make an electron jump between two specific, well-defined energy levels.**
- This frequency is incredibly high (hundreds of terahertz) and is dictated by the laws of quantum mechanics, making it the most stable and precise reference for time.
- **Hence, option (b) is the correct answer.**

Q 53. A • **BioTRIG is an advanced waste-to-energy technology based on the pyrolysis process, designed to address waste disposal, energy scarcity, indoor air pollution, and soil degradation, particularly in rural India. It converts organic waste into bio-oil, syngas, and biochar, promoting sustainability and circular economy principles.**

- Pyrolysis is a kind of chemical recycling that turns leftover organic materials into their component molecules. It works by sealing the waste inside an oxygen-free chamber and heating it above 400 degrees Celsius. Useful chemicals are produced in the process. **The process yields three major products:**
 - Bio-oil: A clean liquid fuel for cooking and industrial use.
 - Syngas: A hydrogen-carbon monoxide gas mix used for electricity and heat generation. Biochar: A carbon-rich solid improving soil fertility and aiding in carbon sequestration.
 - The BioTRIG system could also be effective in real-world applications. It could help reduce greenhouse gas emissions from communities by nearly 350 kg of CO₂-eq per capita per annum.
- Hence, option (a) is the correct answer.**

- Q 54. B**
- Ocean Thermal Energy Conversion (OTEC) technologies use the temperature difference between warm seawater at the surface of the ocean, and cold seawater at between 800–1 000 metres (m) depth to produce electricity. The warm seawater is used to produce a vapour that acts as a working fluid to drive turbines. The cold water is used to condense the vapour and ensure the vapour pressure difference drives the turbine. **Hence statement 1 is correct.**
 - OTEC technologies are differentiated by the working fluids that can be used. **Open Cycle OTEC uses seawater as the working fluid, Closed Cycle OTEC uses mostly ammonia.** A variation of a Closed Cycle OTEC, called the Kalina Cycle, uses a mixture of water and ammonia. The use of ammonia as a working fluid reduces the size of the turbines and heat exchangers required. **Hence, statement 2 is correct.**
 - Other components of the OTEC plant consists of the platform (which can be land-based, moored to the sea floor, or floating), the electricity cables to transfer electricity back to shore, and the water ducting systems. There is considerable experience with all these system components in the offshore industry. The technical challenge is the size of the water ducting systems that need to be deployed in large scale OTEC plants.
 - So far, only OTEC plants up to 1 MW have been built. Although it is technically feasible to build 10 MW plants using current design, manufacturing, deployment techniques and materials, the actual operating experience is still lacking. It is therefore important to learn and share the experience from the 10 MW plants under construction to ensure continuous and accelerated deployment. **Hence statement 3 is not correct.**

- Q 55. A**
- The Sveriges Riksbank Prize in Economic Sciences 2025 (Nobel Prize in Economic Sciences) was awarded to Joel Mokyr, Philippe Aghion and Peter Howitt for explaining innovation-driven economic growth. Hence, option (a) is the correct answer.
 - About The Sveriges Riksbank Prize in Economic Sciences (Nobel Prize of economics)
 - Establishment: In 1968 by Sveriges Riksbank (Sweden's central bank).
 - It is not one of the five Nobel Prizes established by Alfred Nobel's will in 1895.
 - Awarded by: The Royal Swedish Academy of Sciences
 - First recipients: To Ragnar Frisch and Jan Tinbergen in 1969.
 - Amartya Sen was the first Indian to receive Nobel Prize for Economics in 1998 for his contributions to welfare economics and social choice theory.



- Q 56. A**
- **Persistent Organic Pollutants (POPs) are a group of compounds that possess toxic properties, resist degradation, bioaccumulate and are transported through air, water and migratory species, across international boundaries and deposited far from their place of release, where they accumulate in terrestrial and aquatic ecosystems.**
 - POPs are environmentally persistent. They resist breakdown by natural processes, and, in some cases, remain in the environment for decades. **POPs resist breakdown in water but they are soluble in fatty tissue, which makes them bio-available to mammals. They bio-accumulate exponentially up the food chain, reaching the greatest magnitudes in predatory birds, mammals and humans.** In addition, these substances bio-concentrate under typical environmental conditions. Bio-concentration is the process by which animals absorb high concentrations of POPs directly from their environment, rather than from a combination of eating other animals and environmental exposure.
 - The Stockholm Convention seeks the elimination or restriction of production and use of all intentionally produced POPs (industrial chemicals and pesticides). **Hence, both the Statement-I and Statement-II are correct, and Statement-II is the correct explanation for Statement-I.**

- Q 57. B**
- **Flue gas desulphurisation is a method used to remove sulfur dioxide (SO₂) from exhaust flue gases of fossil-fuel power plants.** Flue gas is emitted as a byproduct of combustion of fossil fuels. It mainly contains pollutants such as carbon dioxide (CO₂), sulphur dioxide (SO₂), nitrogen oxides, particulate matter, etc
 - FGD units specifically target the SO₂ emissions in flue gas. SO₂ is an acidic gas, and is usually treated with a basic compound in the FGD unit to neutralise the pollutant. **There are three common types of FGD systems around the world — dry sorbent injection, wet limestone treatment, and using sea water to remove SO₂.**
 - **The dry sorbent injection method involves adding a powdered sorbent like limestone to the flue gas, where it reacts with SO₂. The resultant compound can be removed by using an electrostatic precipitator, or a fabric filter.**
 - **The wet limestone treatment method also uses limestone to remove SO₂, but instead of using it in a powdered form, it uses a limestone slurry.** Passing SO₂ through this slurry results in the formation of gypsum, which is a stable compound and has wide applications in industries like construction. This is the commonly used technology, and has very high efficiency. **Hence, option (b) is the correct answer.**

- Q 58. B**
- **The 47th ASEAN Summit was held in Kuala Lumpur, Malaysia, from October 26–28, 2025. The summit was chaired by Malaysian Prime Minister Anwar Ibrahim, and its theme was "Inclusivity and Sustainability". Major outcomes included the admission of Timor-Leste as the 11th member of ASEAN and the adoption of the Kuala Lumpur Peace Accord.**
 - Dates: October 26–28, 2025
 - Location: Kuala Lumpur Convention Centre (KLCC) in Kuala Lumpur, Malaysia
 - Chair: Prime Minister of Malaysia, Anwar Ibrahim
 - Theme: "Inclusivity and Sustainability"
 - Key outcomes:
 - **Timor-Leste was admitted as the 11th member of ASEAN. ASEAN currently has a total of 11 member states.**

- The Kuala Lumpur Peace Accord was adopted.
- Discussions included the crisis in Myanmar and regional economic cooperation.
- **Hence, statement 1 is correct, and statement 2 is not correct.**
- **India and ASEAN have a Comprehensive Strategic Partnership, established in 2025, which builds on previous dialogue and aims to enhance cooperation in areas like economics, security, and connectivity.** This partnership is a key component of India's Act East Policy and is considered a foundation for regional stability and development. It includes a strategic plan for maritime cooperation, announced for 2026, and focuses on shared interests such as a free and open Indo-Pacific. **Hence, statement 3 is correct.**

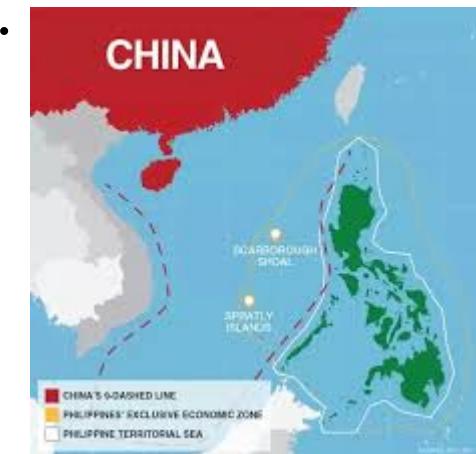
Q 59. B • **Adaptation Gap Report:** This report is published annually by the **United Nations Environment Programme (UNEP)**.

- Focus: It assesses the global progress on adaptation planning, financing, and implementation, and identifies the gaps that exist.
- **Hence, pair 1 is not correctly matched.**
- **World Investment Report:** The **United Nations Conference on Trade and Development (UNCTAD)** produces this report.
 - Focus: It tracks global trends in Foreign Direct Investment (FDI) and analyses their impact on development. **Hence, pair 2 is correctly matched.**
- **World Economic Outlook (WEO):** The **International Monetary Fund (IMF)** is the publisher for this report.
 - Focus: It provides the IMF's analysis of global economic developments and prospects for the near and medium term, often including updated growth forecasts. **Hence, pair 3 is correctly matched.**

Q 60. B • The 2025 East Asia Summit was hosted by Malaysia, not Laos. Laos hosted the 19th East Asia Summit in 2024.

- **2024:** The 19th East Asia Summit was held in Laos.
- **2025:** The 20th East Asia Summit took place in Kuala Lumpur, Malaysia, on October 26–28, 2025. The summit was part of Malaysia's 2025 chairmanship of ASEAN, a role which it also held for the ASEAN Summits that year, according to this Wikipedia article on the 2025 ASEAN Summits. **Hence, statement 1 is not correct.**
- The **East Asia Summit (EAS) process was initiated in 2005** with the convening of the 1st East Asia Summit in Kuala Lumpur, Malaysia. At its inception, the East Asia Summit comprised 16 participating countries, namely ASEAN Member States, Australia, China, India, Japan, New Zealand, and the Republic of Korea. The United States and Russian Federation joined at the 6th East Asia Summit in Bali, Indonesia on 19 November 2011. **Hence, statement 2 is correct.**

Q 61. A • Scarborough Shoal (known as Panatag Shoal in the Philippines) is a disputed territory in the South China Sea. It is a major flashpoint and the subject of an intense maritime and territorial dispute between the People's Republic of China and the Republic of the Philippines. News about confrontations between naval vessels and fishing boats in this area is frequent. **Hence, pair 1 is correctly matched.**



- The Fergana Valley is a densely populated and historically important region located in Central Asia, shared by Uzbekistan, Kyrgyzstan, and Tajikistan. It is often in the news due to ethnic tensions, border disputes, water resource issues, and historical religious extremism, making it a critical geopolitical region in Central Asia. The insurgency in Mozambique is related to Cabo Delgado. **Hence, pair 2 is not correctly matched.**



- Cabo Delgado is a coastal province located in the northernmost part of Mozambique (Southern Africa). It is frequently in the news due to a violent jihadist insurgency (primarily by the group Ahlu Sunnah Wa-Jama'ah, or Al-Shabaab). The conflict is driven by poverty, natural gas wealth, and extremist ideology, not a border conflict in Central Asia. **Hence, pair 3 is not correctly matched.**



Q 62. D • Biofuel is a fuel that is produced through contemporary processes from biomass, rather than by the very slow geological processes involved in the formation of fossil fuels, such as oil. Since biomass technically can be used as a fuel directly, some people use the terms biomass and biofuel interchangeably.

- Biofuels are generally classified into:-
- **First-generation biofuels** - First-generation biofuels are made from sugar, starch, vegetable oil, or animal fats using conventional technology. Common first-generation biofuels include Bioalcohols, Biodiesel, Vegetable oil, Bioethers, Biogas. **Hence pair 1 is not correctly matched.**
- **Second-generation biofuels** - These are produced from non-food crops, such as cellulosic biofuels and waste biomass (stalks of wheat and corn, and wood). Examples include advanced biofuels like biohydrogen, biomethanol. **Hence pair 2 is not correctly matched.**
- **Third-generation biofuels** - These are produced from specially engineered micro-organisms like algae. Production of biofuels from algae usually relies on the lipid content of the microorganisms. **Hence pair 3 is correctly matched.**
- **Fourth-generation biofuels**- These combine genetically engineered feedstock with genetically synthesized microorganisms, such as cyanobacteria, to efficiently generate bioenergy. The fourth-generation biofuels are in the development and experimental stages

Q 63. B • **The Green Open Access Rules, 2022 were notified under the Electricity Act, 2003.** The rules are called the "Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022" and were issued by the Ministry of Power to promote the generation, purchase, and consumption of green energy through open access. **Hence, statement 1 is not correct.**

- The salient features and benefits to common consumers from 'Green Energy Open Access' are as follows:
 - These rules are notified for promoting generation, purchase and consumption of green energy including the energy from Waste-to-Energy plants.
 - **The 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, to enable small consumers also to purchase renewable power through open access. **Hence statement 2 is correct.**
 - **Consumers are entitled to demand supply of Green Power from Discoms. Discoms would be obligated to procure and supply green power to eligible consumers.** Hence, statement 3 is correct.
 - These Rules have streamlined the overall approval process for granting open access. Time bound processing by bringing uniformity and transparency in the application as well as approval of open access through a national portal has been mandated. Approval for Green Open Access is to be granted in 15 days or else it will be deemed to have been granted.
 - Commercial and Industrial consumers are allowed to purchase green power on voluntarily basis.
 - Provide certainty on open access charges to be levied on Green Energy Open Access Consumers which includes transmission charges, wheeling charges, cross subsidy surcharge, standby charges wherever applicable, banking charge and other fees and charges such as Load Despatch Centre fees and scheduling charges, deviation settlement charges as per the relevant regulations of the Commission.
 - There shall be a uniform Renewable Purchase Obligation (RPO), on all obligated entities in area of a distribution licensees. Green Hydrogen/Green Ammonia has also been included for

fulfillment of its RPO.

- Consumers will be given Green Certificates if they consume green power and will also be facilitated.

- Q 64. D**
- **Standards and Labelling (S&L) scheme is a flagship initiative of Ministry of Power** that was launched with the key objective of providing consumers an informed choice regarding the energy savings and thereby the cost-saving potential of various energy consuming appliances.
 - BEE star label is a mark that indicates the energy efficiency of an electrical appliance. The label has a star rating ranging from 1 to 5, with 5 stars being the most energy-efficient. The higher the number of stars, the more energy-efficient the appliance is.
 - **The BEE star label is mandatory for certain appliances** including **Room Air Conditioners (Cassette, Floor Standing), LED Lamps, Colour TV, Inverter Air Conditioners, Electric Geysers, Direct Cool Refrigerator, Distribution Transformer, Room Air Conditioner (Variable Speed), Tubular Fluorescent Lamps (TFL), Frost Free (No-Frost) Refrigerator, Light Commercial AC, Ceiling Fans, Deep Freezer, Washing Machine, Chillers, UHD Color Television, Room Air Conditioner (Fixed Speed)**. **Hence, option (d) is the correct answer.**
 - **Appliance under voluntary programme include microwave oven, solar heater, pump sets etc.**

- Q 65. D**
- **RECLAIM FRAMEWORK**

- The RECLAIM framework is a community engagement and development model for mine closure and repurposing launched by the Ministry of Coal on July 4, 2025. Developed by the Coal Controller Organisation in partnership with the Heartfulness Institute, its purpose is to ensure a just and sustainable transition for communities affected by mining. It provides a structured approach with tools and templates to incorporate community needs in mine closure plans, focusing on ecological restoration, socio-economic continuity, and gender inclusivity.
- Key objectives
 - Empower communities: Ensure that the needs and perspectives of local communities are integrated into the mine closure process.
 - Ensure just transition: Facilitate a smooth transition for communities by addressing both ecological and socio-economic needs.
 - Promote sustainability: Support ecological restoration through land reclamation and afforestation, while fostering new, alternate livelihoods.
 - Encourage inclusivity: Specifically emphasise gender inclusivity and the representation of vulnerable groups.
- **Hence, option (d) is the correct answer.**

- Q 66. D**
- **The Green Hydrogen Certification Scheme in India (GHCI)** aims to promote the production and use of Green Hydrogen , which is generated from renewable energy sources. The scheme is designed to facilitate the development of a market in India, ensuring that hydrogen produced is genuinely green and contributes to reducing carbon emissions.
 - **The Green Hydrogen certificate shall be mandatory** for Green Hydrogen facility/producers in following cases; where

- Green Hydrogen Production Facility/ Green Hydrogen Producer is receiving any incentive/subsidy from Government,
- **Green Hydrogen Production Facility/ Green Hydrogen Producer intends to sell/use Green Hydrogen in India. Hence, statement 1 is correct.**
- The Green Hydrogen certificate serves as a label which guarantees the origin (GO) of the Green Hydrogen production as well as chain of custody. To maintain and track the chain of custody, the certificate shall be transferable as per procedure laid down by MNRE. **The certificate can be used for the purpose of claiming carbon credit under Carbon Credit Trading Scheme (CCTS) of India. Hence, statement 2 is correct.**
- The following Eligible Hydrogen Production Pathways are currently considered within scope of this scheme, and therefore eligible to apply:
 - **Electrolysis and**
 - **Conversion of Biomass. Hence, statement 3 is correct.**

Q 67. B Using the power under Environment (Protection) Act, 1986, the Ministry of Environment, Forest and Climate Change (MoEFCC) notified the Environment Protection (Management of Contaminated Sites) Rules, 2025 on July 24, 2025, to provide a legal framework for identifying, assessing, and remediating chemically contaminated sites. **Hence, statement 1 is correct.**

Key highlights of the Rules

- Contaminants Covered: 189 hazardous substances as per Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.
- **Exclusions: Contamination from radioactive waste, mining, oil spills at sea, and solid waste dumps (governed by separate legislation). Hence, statement 2 is not correct.**
- Response levels: Different response levels are set for agricultural, residential, commercial, and industrial areas.
- Contaminated Site Management
 - **Site Identification: Local bodies/District Administrations must report suspected sites twice a year to State Pollution Control Boards (SPCBs) Hence, statement 3 is correct.**
 - Site Assessment: SPCBs shall inspect the suspected sites and list of probable contaminated sites and inform to the CPCB on the centralised online portal.
 - Polluter Identification: SPCBs identify the polluter. If land is sold, the new owner is liable.
 - Clean-Up Plan: Polluter must carry out a clean-up plan using an approved agency, and pay for it.
 - However, if the polluter is not identified, SPCB execute this.
- Funding for assessment and remediation: Initial assessment costs may be covered by the Central Government from the Environmental Relief Fund under Public Liability Insurance Act, 1991 and also by the State Government.
- If the polluter is found, these costs must be repaid within 3 months.

Q 68. B • The Belém Package refers to the comprehensive set of negotiated decisions and outcomes adopted at the 30th Conference of the Parties (COP 30) to the United Nations Framework Convention on Climate Change (UNFCCC), held in Belém do Pará, Brazil, in November 2025.

- Key Components of the Belém Package

- Two New Initiatives:
 - Global Implementation Accelerator: Launched as a two-year programme to bridge the gap between national climate plans and the 1.5°C pathway.
 - The Belém Mission to 1.5: An action-oriented platform under the COP29-COP31 troika to foster international cooperation across mitigation, adaptation, and investment.
 - Global Mutirao Decision: A high-level political text adopted by Parties. It includes:
 - Scaling up climate finance for developing countries to at least \$1.3 trillion annually by 2035 for climate action.
 - Double adaptation finance by 2025 and triple by 2035.
 - COP also adopted the Global Goal on Adaptation (GGA) with 60 indicators to assess global adaptation progress.
 - Just Transition Mechanism: Announced to boost cooperation, technical support, capacity-building and enable equitable, inclusive just transitions.
 - Two Roadmaps: The Forest and Climate Roadmap (to halt and reverse deforestation) and The Transitioning Away From Fossil Fuels Roadmap.
- Hence, option (b) is the correct answer.

- Q 69. C**
- Onshore wind refers to wind turbines installed on land, harnessing the kinetic energy of moving air to generate electricity. Offshore wind involves turbines situated at sea or in large freshwater bodies, where wind speeds are typically higher and more consistent.
 - India hosts several major onshore wind power installations. Among the largest are the **Muppandal Wind Farm in Kanyakumari**, the Jaisalmer Wind Park in Rajasthan, and the **Brahmanvel Wind Farm in Dhule, Maharashtra**.
 - Other significant sites include the Dhalgaon installation in Sangli, **the Vankusawade Wind Park in Satara district**, and additional Maharashtra-based projects such as **Vaspet and Tuljapur in Osmanabad**. Beyond these, notable wind parks include Beluguppa in Andhra Pradesh and Mamatkheda in Madhya Pradesh, all contributing substantially to India's renewable energy capacity.
 - Hence, option (c) is the correct answer.

- Q 70. C**
- The byproducts of anaerobic digestion of organic materials are commonly referred to as 'biogas' because of the biological nature of gas production. **Biogas technology refers to the production of a combustible gas (called biogas)** and a value added fertilizer (called slurry or sludge) by the **anaerobic fermentation of organic material under certain controlled conditions**. Hence, statement 1 is correct.
 - **Biogas** is produced by microbial activities and can be used only at the place where it is produced. The main constituents of biogas are :
 - **about 55-65% Methane (CH₄)**
 - **30-45% Carbon dioxide (CO₂)**
 - **traces of hydrogen sulfide (H₂S)**
 - fractions of water vapors. Hence, statement 2 is correct.

- The calorific value of biogas is about 4,500–5,000 kcal per m³, and efficient gas production requires an optimum C:N ratio of around 30:1 and an operating temperature of about 35–40 °C.
- Biogas offers several merits, including improved rural sanitation, reduced deforestation, safer and cleaner waste-disposal, and the production of high-quality organic manure. **The density of biogas is lesser than the density of air. Hence, the chance of fire accident is very much lower compared to LPG. Hence, statement 3 is correct.**

- Q 71. D**
- Ocean acidification is a significant and growing concern in our marine ecosystems. It refers to the decrease in pH levels within the ocean, primarily due to the release and absorption of carbon dioxide (CO₂) from human activities such as burning fossil fuels and deforestation. As CO₂ dissolves into seawater, it forms carbonic acid, which lowers the pH and makes the ocean more acidic.

- **Ocean Acidification Influencing Factors**
 - **Sea Surface Temperature:** A temperature rise accelerates ocean acidification due to increased CO₂ absorption in warmer waters.
 - **Salinity:** Greater salinity reduces the solubility of CO₂, mitigating acidification to some extent.
 - **Particulate Organic Carbon (POC):** Higher POC levels are beneficial, as organic carbon binds with CO₂, lowering free CO₂ concentration in water and mitigating acidification effects.
 - **Particulate Inorganic Carbon (PIC):** High PIC concentrations aggravate acidification by increasing carbonates, which release CO₂ upon dissolution.
 - **Dissolved Oxygen:** A decline in oxygen levels may aggravate acidification by destabilising carbonate compounds essential for marine organisms.
- **Hence, option (d) is the correct answer.**

- Q 72. B**
- **Arsenic** is a natural component of the earth's crust and is widely distributed throughout the environment in the air, water and land. It is highly toxic in its inorganic form.
 - People are exposed to elevated levels of inorganic arsenic through drinking contaminated water, using contaminated water in food preparation and irrigation of food crops, industrial processes, eating contaminated food and smoking tobacco.
 - **Long-term exposure to inorganic arsenic, mainly through drinking-water and food, can lead to chronic arsenic poisoning. Skin lesions and skin cancer** are the most characteristic effects. **Hence, statement 1 is correct.**
 - The greatest threat to public health from arsenic originates from contaminated groundwater. Inorganic arsenic is naturally present at high levels in the groundwater of a number of countries. Fish, shellfish, meat, poultry, dairy products and cereals can also be dietary sources of arsenic, although exposure from these foods is generally much lower compared to exposure through contaminated groundwater. **In seafood, arsenic is mainly found in its less toxic organic form. Inorganic arsenic compounds (such as those found in water) are highly toxic while organic arsenic compounds (such as those found in seafood) are less harmful to health. Hence, statement 3 is not correct.**
 - **People who smoke tobacco can also be exposed to the natural inorganic arsenic content of tobacco because tobacco plants can take up arsenic naturally present in the soil. Hence,**

statement 2 is correct.

- Q 73. C**
- The Minamata Convention is the first global environmental agreement negotiated in the 21st millennium. It reflects an innovative and comprehensive approach, addressing mercury throughout its life cycle from its mining to its management as waste.
 - The Minamata Convention draws attention to a global and ubiquitous metal that, while naturally occurring, has broad uses in everyday objects and is released to the atmosphere, soil and water from a variety of sources.
 - Controlling the anthropogenic releases of mercury throughout its lifecycle has been a key factor in shaping the obligations under the Convention.
 - The Minamata Convention is a 21st-century response to the **catastrophic pollution in Minamata, Japan, where industrial releases of methylmercury caused the epidemic known as the Minamata disease** in the 1950s and onwards. **Hence, statement 1 is correct.**
 - **Representatives from 92 countries formally signed the Minamata Convention, the world's first legally binding treaty, to phase out this highly toxic substance. Hence, statement 2 is correct.**
 - **Minamata Disease is a poisoning disease that nervous system, mainly the central nervous system, is damaged by methylmercury.**
 - The treaty sets a phase-out date of 2020 for a list of products and gives governments about 15 years to end all mercury mining. The treaty has been ratified by 50 countries.
 - Studies comparing ethylmercury and methylmercury suggest that they are processed differently in the human body. Ethylmercury is broken down and excreted much more rapidly than methylmercury.
 - **Therefore, ethylmercury (the type of mercury in the influenza vaccine) is much less likely than methylmercury (the type of mercury in the environment) to accumulate in the body and cause harm.**

- Q 74. D**
- **Solar Energy Corporation of India Limited (SECI)** is the foremost Navratna CPSU dedicated to the growth and development of Renewable Energy (RE) capacity in India. To realize India's ambitious RE targets, the Government of India designated SECI as a nodal agency to enable meeting the growing energy demand through RE and reducing the dependence on fossil fuels.
 - The company primarily operates under the following domains:
 - **Energy Management (Power Trading):**
 - **SECI is a Category-I (highest) Power Trading Licensee for trading power on Pan-India basis.** It is the intermediary power procurer for projects being set up through SECI tenders. It procures power from successful developers under its tenders and sells to Buying Entities (i.e. DISCOMs) through long term PPAs and PSAs respectively. SECI is a premier trader of RE power in the country. **Hence, statement 1 is correct.**
 - **Setting Up Projects Through Own Investment:**
 - **SECI currently owns and operates Renewable Energy projects with a total capacity of 122.7 MW. Hence, statement 2 is correct.**
 - **Consultancy Services**

- **SECI offers Project Management Consultancy in Renewable Energy sector** to Public Sector/Government entities, including Feasibility Studies, Bid process Management, Construction Monitoring and Management, Commissioning etc. **Hence, statement 3 is correct.**
- Emerging Areas
 - To align with the rapidly evolving RE sector, **SECI is venturing into new business areas, including Green Hydrogen, Greening the Transport Sector, Energy Storage, Market-Based Models for Supply of RE, among others.** In doing so, SECI is actively collaborating with relevant stakeholders to explore and tap into the potential of these emerging opportunities. **Hence, statement 4 is correct.**

- Q 75. B**
- The objectives of the Rotterdam Convention are to promote **shared responsibility and cooperative efforts** among Parties in the **international trade of certain hazardous chemicals** in order to protect human health and the environment from potential harm; and to contribute to the environmentally sound use of those hazardous chemicals, by facilitating information exchange about their characteristics, by providing for a national decision-making process on their import and export and by disseminating these decisions to Parties.
 - The Convention creates **legally binding obligations for the implementation of the Prior Informed Consent. (PIC) procedure.** The Rotterdam Convention was adopted in 1998 and entered into force in 2004. **Hence, statement 2 is correct.**
 - **The Cartagena Protocol on Biosafety to the Convention on Biological Diversity** is an international agreement which aims to ensure the safe handling, transport and use of living modified organisms (LMOs) resulting from modern biotechnology that may have adverse effects on biological diversity, taking also into account risks to human health. **Hence, statement 1 is not correct.**
 - International trade of two new hazardous pesticides — Iprodione and Terbufos — has been recommended for “prior informed consent” (PIC) procedure under the Rotterdam Convention. The chemicals are dangerous for humans and aquatic animals. **Hence, statement 3 is correct.**
 - The PIC procedure is a mechanism for formally obtaining and disseminating the decisions of importing parties on their willingness to receive future shipments of hazardous chemicals.
 - In India, the use of these chemicals was permitted by the 2015 Anupam Verma committee report. The country is among the largest exporters of Terbufos.
 - **Iprodione, a fungicide used on vines, fruits, trees and vegetables, has been classified as carcinogenic and toxic for reproduction.**
 - **Terbufos is a soil insecticide used commonly on sorghum, maize, beet and potatoes. It has also been found to pose risk to aquatic organisms due to its toxicity.**
 - Both the pesticides, which are used in agriculture, are known for their harmful impacts on human health and the environment.

- Q 76. C** Ozone-depleting substances (ODS) are chemicals that damage the Earth's protective ozone layer, such as chlorofluorocarbons (CFCs), halons, and hydrochlorofluorocarbons (HCFCs).
- Halons: These are extremely potent ODS, primarily used in fire extinguishers. They contain bromine atoms, which are more destructive to ozone molecules than chlorine atoms.

- Carbon tetrachloride: Formerly used widely as a solvent and in fire extinguishers, its production and use have been phased out due to its high ozone-depleting potential.
- Methyl Bromide: This compound has been used as a fumigant in agriculture and is a significant ODS due to its bromine content.
- Methyl Chloroform: Also known as 1,1,1-trichloroethane, it was used as a solvent in industrial cleaning and is classified as an ODS.

Hydrofluorocarbons (HFCs): These compounds were developed as alternatives to CFCs and HCFCs because they do not contain chlorine or bromine and thus have a zero or near-zero Ozone Depleting Potential (ODP).

Hence, option (c) is the correct answer.

Q 77. C • Bisphenol A (BPA) is a chemical used to make polycarbonate plastic. Polycarbonate plastic is used to make hard plastic items, such as baby bottles, re-usable water bottles, food containers, pitchers, tableware and other storage containers. Hence, statement 1 is correct.

- Small amounts of BPA may remain in polycarbonate products and be released into food and beverages. Canned foods and liquids stored or heated in polycarbonate containers, cans appear to be the main source of exposure to BPA.
- BPA is classified as a hazardous chemical due to its ability to damage fertility, and cause serious eye damage, allergic skin reactions and respiratory irritation. In addition, BPA is an endocrine disruptor that can disrupt the normal functioning of the hormone system. It can affect reproductive function, mammary gland development, cognitive function and metabolism. Hence, statement 2 is correct.

Q 78. B • Tropospheric (or ground-level) ozone is a short-lived climate pollutant that remains in the atmosphere for only hours to weeks. Hence, statement 1 is correct.

- Tropospheric, or ground level ozone, is not emitted directly into the air, but is created by chemical reactions between oxides of nitrogen (NO_x) and volatile organic compounds (VOC). This happens when pollutants emitted by cars, power plants, industrial boilers, refineries, chemical plants, and other sources chemically react in the presence of sunlight. Hence, statement 2 is not correct.

- Though it is short-lived in the atmosphere, tropospheric ozone has multiple negative impacts on humans, plants, and the climate.

• **Climate Impacts:**

- Ozone absorbs radiation and consequently acts as a strong greenhouse gas. Tropospheric ozone affects the climate beyond increased warming, having impacts on evaporation rates, cloud formation, precipitation levels, and atmospheric circulation. These impacts mainly occur within the regions where tropospheric ozone precursors are emitted, and so disproportionately affect the Northern Hemisphere. Hence, statement 3 is correct.

Q 79. C • In October 2025, the UN General Assembly elected India unopposed to the UNHRC for a three-year term starting on January 1, 2026, and ending on December 31, 2028. This marks India's seventh term on the Council. Hence, statement 1 is correct.

- The UNHRC itself is composed of only 47 Member States. These 47 members are elected by the United Nations General Assembly (UNGA), which does consist of 193 Member States. The 193 UN Member States participate in the election of the UNHRC members, but the Council itself only has 47 seats. Hence, statement 2 is not correct.
- In accordance with General Assembly Resolution 60/251, the 47 Member States of the Council are elected directly and individually by a secret ballot by the majority of the members of the UN General Assembly (UNGA). The election is held by secret ballot, with a majority of the UNGA members needed to elect new members for three-year terms. Hence, statement 3 is correct.

- Q 80. C**
- India submitted its Long-Term Low Carbon Development Strategy (LT-LEDS) on November 14, 2022, at COP 27. It encompasses the objectives of the National Hydrogen Policy.

Long-Term Low Emission Development Strategy (LT-LEDS)

Elements	Current policies and targets
 Low carbon development of electricity systems consistent with development	<ul style="list-style-type: none"> NDC Target: 50% of non-fossil capacity by 2030. Renewable Purchase Obligations for distribution companies, open access consumers and captive power plants. Green energy corridors to strengthen transmission networks in 8 Renewable Energy (RE) rich States. A three-fold rise in nuclear installed capacity by 2032.
 Integrated, efficient, inclusive low-carbon transport system	<ul style="list-style-type: none"> 20% ethanol blending in petrol by 2025. Indian Railways to become net-zero by 2030. Leapfrogging to directly reach Bharat Stage VI emissions. A National Master Plan for Multi-modal Connectivity - PM Gati Shakti.
 Adaptation in urban design, energy and material-efficiency in buildings, and sustainable urbanisation	<ul style="list-style-type: none"> National Urban Policy Framework (NUPF). National Building Code, Energy Conservation Building Code, Eco-Nivas Samridhi (an energy conservation building code for residential buildings). India Cooling Action Plan. National Mission on Sustainable Habitat. Extended Producer Responsibility 2021, and Plastic Waste Management (Amendment) Rules 2021.
 Economy-wide decoupling of growth from emissions and development of an efficient, innovative low-emission industrial system	<ul style="list-style-type: none"> National Missions for Enhanced Energy Efficiency and Sustainable Habitat, Standards and Labelling Scheme, and the Energy Efficiency Financing Platform. Fuel switching through promotion of natural gas and the National Policy on Bio-Fuels. Material efficiency through policies on resource efficiency, plastic and e-waste, and steel recycling. Green hydrogen technology and infrastructure promotion.
 CO2 removal and related engineering solutions	<ul style="list-style-type: none"> R&D and building human and infrastructure capacity to evolve technologies and methodologies like Carbon Capture Utilisation and Storage (CCUS).
 Enhancing Forest and vegetation cover consistent with socio-economic and ecological considerations	<ul style="list-style-type: none"> NDC target: Create an additional carbon sink of 2.5 to 3 billion tonnes of CO2 equivalent by 2030. Other voluntary contributions: <ul style="list-style-type: none"> To restore 26 million ha degraded land by 2030. 12 National Biodiversity Targets, in line with 20 global Aichi biodiversity goals. Major policies and institutions: National Mission for a Green India, National Afforestation Programme, Nagar Van Yojana, National REDD+ (Reducing Emissions from Deforestation and forest Degradation) Strategy 2018 etc. Major greening efforts of the National Highways Authority of India (NHAI) and Indian Railways.
 Economic and financial aspects of low-carbon development	<ul style="list-style-type: none"> Business Responsibility and Sustainability Report (BRSR) by SEBI for mandatory sustainability reporting. Inclusion of Renewable energy projects under Priority Sector Lending (PSL). Sustainable Finance Group established by RBI to lead regulatory initiatives in the area of investments linked to climate risk and sustainable finance.

- The rapid expansion of green hydrogen production, increasing electrolyser manufacturing capacity in the country, and a three-fold increase in nuclear capacity by 2032 are some of the

other milestones that are envisaged alongside the overall development of the power sector. **Hence, statement 1 is correct.**

- **LT-LEDS has been prepared in the framework of India's right to an equitable and fair share of the global carbon budget and is the practical implementation of India's call for "climate justice."** This is essential to ensure that there are no constraints on realizing India's vision of rapid growth and economic transformation while protecting the environment. **Hence, statement 2 is correct.**

Q 81. A The UN Decade on Ecosystem Restoration (2021–2030) is a global initiative to prevent, halt, and reverse the degradation of ecosystems worldwide. Led by the UN Environment Programme (UNEP) and the Food and Agriculture Organization (FAO), it aims to protect and revive ecosystems for the benefit of people and nature by improving livelihoods, tackling climate change, and preserving biodiversity. The decade calls for global cooperation and encourages participation from individuals. **Hence, statement 1 is correct.**

The Decade covers ecosystem restoration in all types of ecosystems, including forests, grasslands, mountains, oceans, wetlands, urban areas, and more, not only the ones listed. **Hence, statement 2 is not correct.**

The Decade is a global rallying call and framework for voluntary action; it does not mandate legally binding commitments from UN member countries. Countries have made existing voluntary pledges (like the Bonn Challenge), which the Decade aims to support and scale up. **Hence, statement 3 is not correct.**

Q 82. A The Commission for Air Quality Management is responsible for enforcing the implementation of the Graded Response Action Plan (GRAP) to combat air pollution in the Delhi-National Capital Region (NCR). **Hence, statement 1 is correct.**

The Graded Response Action Plan (GRAP) is an emergency, multi-stage plan to combat worsening air pollution in the Delhi-NCR region. It is triggered when the Air Quality Index (AQI) reaches certain thresholds, with actions like restricting vehicles, banning construction, and shutting down schools escalating at each stage. The Commission for Air Quality Management (CAQM) manages its implementation. **Hence, statement 2 is not correct.**

GRAP stages and actions

- Stage I (Poor: AQI 201–300): Actions are taken if air quality is projected to enter this stage.
- Stage II (Very Poor: AQI 301–400): Restrictions include enhanced public transport, increasing parking fees, and restrictions on non-essential trucks in some areas.
- Stage III (Severe: AQI 401–450): Further restrictions include banning BS-III petrol and BS-IV diesel vehicles, halting non-essential construction and demolition, and potentially moving schools to remote learning.
- Stage IV (Severe+ (AQI > 450)): The most stringent measures are implemented, such as banning the entry of most trucks, closing schools, and potentially shutting down non-essential industries.

Q 83. C

- **"Indrajaal" is a cutting-edge, wide-area, autonomous counter-drone/Counter-Unmanned Aerial System (C-UAS) developed by the Hyderabad-based robotics firm, Grene Robotics.**
- **AI-Powered and Autonomous:** The system utilizes Artificial Intelligence (AI) and autonomous technologies to detect, track, and neutralize various aerial threats, ranging from small consumer drones to larger weaponized drones and drone swarms.

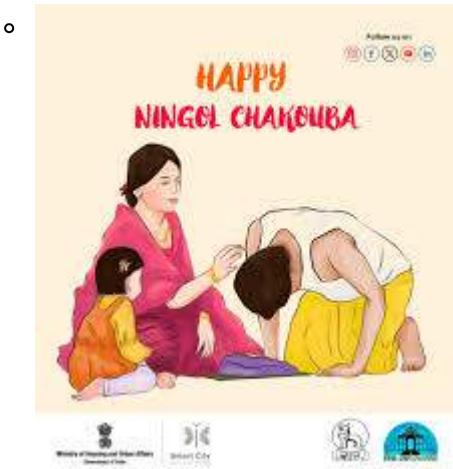
- **Defense Mechanism:** It provides a multi-layered, 360-degree security mechanism over large areas (up to 4,000 square kilometers) by integrating multiple defense technologies like radar, RF (Radio Frequency) sensors, AI-powered command platforms (SkyOS), jammers, spoofers, and interceptor drones.
- **Purpose:** It is designed to protect critical infrastructure, military bases, high-value assets, and national borders from the growing threat of hostile Unmanned Aerial Vehicles (UAVs). The recently launched "Indrajaal Ranger" is a fully mobile version of this system mounted on a vehicle.



- Q 84. C**
- Pyrolysis is a process of chemically **decomposing organic materials at elevated temperatures in the absence of oxygen**. The process typically occurs at temperatures above 430°C (800°F) and under pressure. It simultaneously involves the **change of physical phase and chemical composition, and is an irreversible process**. Hence, statements 1 is correct.
 - Pyrolysis is commonly used to convert organic materials into a solid residue containing ash, carbon and small quantities of liquid and gases. It **produces the synthetic gases also known as syngas (methane, carbon dioxide, hydrocarbons, hydrogen and carbon mono-oxide), liquids and solids residues**. The produced syngas can be utilized in different energy applications such as engines, boilers, turbines, heat pumps. Hence, statement 2 is correct.
 - **Extreme pyrolysis**, on the other hand yields carbon as the residue and the process is called carbonization. Unlike other high- temperature processes like hydrolysis and combustion, pyrolysis does not involve reaction with water, oxygen or other reagents. Plastic Pyrolysis is a chemical reaction. This reaction involves the molecular breakdown of larger molecules into smaller molecules in the presence of heat. Pyrolysis is also known as thermal cracking, cracking, thermolysis, depolymerization, etc.

- Q 85. C**
- Ningol Chakouba – Manipur

- Ningol Chakouba is a major traditional festival celebrated in Manipur. It is a social festival where married daughters ("Ningol") are invited to a grand feast at their parental home. It falls on the second lunar day of the Hiyangei month (October/November). Hence, pair 1 is correctly matched.



- **Kati Bihu**
 - Kati Bihu (or Kongali Bihu) is one of the three Bihu festivals and is celebrated in Assam, **not Odisha**. It marks the time when the paddy transplantation is completed and the beginning of the harvesting season. **Hence, pair 2 is not correctly matched.**
- Bathukamma is a state festival of Telangana, India. It is a vibrant, nine-day floral festival dedicated to Goddess Gauri, and it is considered a symbol of the state's cultural identity. While its main celebration is in Telangana, it is also observed in some parts of Andhra Pradesh.
 - Celebration: It takes place during the nine days of Navratri, which typically falls in September or October.
 - Key activities: The festival involves women creating elaborate, conical flower arrangements (called Bathukammas), singing folk songs, and immersing the arrangements in water bodies to conclude the festivities. **Hence, pair 3 is correctly matched.**



- Q 86. C**
- Aspartame is a low-calorie artificial sweetener that is approximately 200 times sweeter than sugar. It is a white, odourless powder and is used in more than 5,000 food products globally. **Aspartame is widely used in various food and beverage products since the 1980s, including diet drinks, chewing gum, gelatin, ice cream, dairy products such as yogurt, breakfast cereal, toothpaste and medications such as cough drops and chewable vitamins.**

- Artificial sweetener aspartame has been labelled “possibly carcinogenic to humans”, according to the International Agency for Research on Cancer (IARC), which is the cancer agency of the World Health Organization (WHO). **Hence, pair 1 is correctly matched.**
- **Parabens are commonly used as preservatives in cosmetics. Parabens are a family of related chemicals that are commonly used as preservatives in cosmetic products.** Preservatives may be used in cosmetics to prevent the growth of harmful bacteria and mold, in order to protect both the products and consumers. The parabens used most commonly in cosmetics are methylparaben, propylparaben, butylparaben, and ethylparaben.
 - There are some negative impacts on human health. Use of cosmetics with parabens could pose a risk of breast cancer in women and when these personal care products end up in water bodies with urban and hospital waste, they become a threat to corals and may cause hormonal disruptions in dolphins and other marine animals as well. **Hence, pair 2 is correctly matched.**
- **Styrene is primarily used in the production of polystyrene plastics and resins.** As it is used in the production of polystyrene plastics and resins. **These materials are subsequently used in food packaging, rubber, plastic, insulation, fiberglass, pipes and automobile parts.** Styrene, a likely **carcinogenic chemical**, can enter the human body through the skin, eyes, and predominantly through respiration. It gets absorbed into the blood more through alveoli in lungs. **Hence, pair 3 is correctly matched.**

- Q 87. C**
- **The Chess World Cup 2025 was a 206-player single-elimination chess tournament took place in Goa, India, from 31 October to 27 November 2025. It was the 11th edition of the Chess World Cup.** Javokhir Sindarov won the tournament, who became the youngest player to date to win the World Cup, at the age of 19.
 - The FIDE (Fédération Internationale des Échecs or International Chess Federation) is the sole international body responsible for regulating the sport and awarding the official GM title and other international titles. **Hence, statement 1 is correct.**
 - Achieving a FIDE Standard (Classical) rating of at least 2500 at some point in their career is a mandatory rating criterion for the GM title. The other primary requirement is securing three GM norms. **Hence, statement 2 is correct.**
 - **As of early December 2025, India has 91 chess Grandmasters, following Raahul VS becoming the 91st. India also has 23 Woman Grandmasters and over 30,000 rated players.** Hence, **statement 3 is correct.**

- Q 88. A**
- **Stockholm Convention:** The Stockholm Convention is a global treaty to protect human health and the environment from POPs (Persistent Organic Pollutants). It was opened for signature in 2001 in Stockholm (Sweden) and became effective in 2004. POPs are listed in various Annexes to the Stockholm Convention after thorough scientific research, deliberations and negotiations among member countries.
 - **Rotterdam Convention:** The Rotterdam Convention was adopted in 1998 by a Conference of Plenipotentiaries in Rotterdam, the Netherlands. It covers pesticides and industrial chemicals that have been banned or severely restricted for health or environmental reasons by Parties and which have been notified by Parties for inclusion in the Prior Informed Consent (PIC) procedure. The Convention creates legally binding obligations for the implementation of the Prior Informed Consent (PIC) procedure.

- **Basel Convention:** It was adopted in 1989 by the Conference of Plenipotentiaries in Basel, Switzerland, the “Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal”, generally known as the Basel Convention, came into force in 1992. It is an international treaty that aims to reduce the movement of hazardous waste between countries.
- **Minamata 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 declaration was read in Nusa Dua, Bali, where Indonesia is hosting the COP4 to the Minamata Convention on Mercury. It was agreed at the fifth session of the Intergovernmental Negotiating Committee in Geneva, Switzerland 2013.
- **Hence, option (a) is the correct answer.**

- Q 89. A**
- The biomass is the organic matter in trees, agricultural crops and other living plant material. It is made up of carbohydrates-organic compounds that are formed in growing plant life. Biomass is solar energy stored in organic matter. Biomass is a renewable energy source because the growth of new plants and trees replenishes the supply. **The use of biomass for energy causes no net increase in carbon dioxide emissions to the atmosphere.** As trees and plants grow, they remove carbon from the atmosphere through photosynthesis. **That is, the use of biomass for energy does not increase carbon dioxide emissions and does not contribute to the risk of global climate change.** **Hence, statement 1 is correct.**
 - **The efficiency is only about 10% when dung is burnt to produce heat.** The important example is cook stoves used in the rural areas. The efficiency of **conversion of animal residues could be raised to about 60% by digesting anaerobically (to produce biogas).** **Hence, statement 2 is correct.**
 - The energy content of biomass that can be obtained after transformation is an important characteristic of biomass. The energy content is measured as the heating value. Lignin is more abundant and has a higher degree of polymerisation in softwoods than in hard woods. **Woods having higher lignin content and plenty of extractives will have a higher heating value.** Cellulose and hemi-cellulose contain only around 17.5 MJ/kg while lignin has about 26.5 MJ/kg and extractives can approach 35 MJ/kg. **Hence, statement 3 is not correct.**

- Q 90. C**
- Most important properties, which may affect the gasification/pyrolysis, are **calorific value, moisture content, ash content, volatile matter, fixed carbon, ash melting point and bulk density.**
 - **As the calorific value increases, the amount of gas produced at the normal temperature and pressure increases.** This simply means that with the increase in calorific value, the material consumption also decreases. **Hence, statement 1 is correct.**
 - **With increasing moisture content, the calorific value of wood decreases** and correspondingly the amount of gas produced at normal temperature and pressure (NTP) and fraction of useful components decrease. For practical consideration, the wet biomass has also bad flow and handling characteristics and gives inconsistent operation, especially for biomass having 25% moisture on wet basis.
 - With increasing ash content, the removal of the ash from the gasifier becomes more power consuming and fraction of useful components also decrease.

- **The volatile matter** helps in the complex reactions of gasification but **if the volatile matter content is high, tar formation is also high.** Tar is one of the products of thermal decomposition of solid fuels. The tar yield is therefore related to the volatile matter in a fuel. **Hence, statement 2 is correct.**
- **With increasing fixed carbon, the amount of gas produced and the calorific value of the producer gas so obtained increase.** The conversion of carbon to CO which is one of the main components of producer gas is the result of many complex reactions taking place during gasification. **Hence, statement 3 is correct.**
- **Bulk density** is one of the important factors for designing of a gasifier to obtain proper material flow. Biomass with very low bulk density have problem of proper fall through different zones of gasifier.

Q 91. B Global Outlook Council on Water Investments

The Global Outlook Council on Water Investments (GOCWI) is a G20 initiative, launched by South African President Cyril Ramaphosa, that aims to prioritize and mobilize investments for water security. It functions as a high-level political and financial platform to track progress, unlock finance, and align actions across the G20, UN, and private sector to ensure water investments are at the forefront of climate and finance discussions. The GOCWI will guide the expansion of the Africa Water Investment Programme into a Global Water Investment Platform.

Purpose: To ensure water investment is a central part of global climate and finance discussions, rather than an afterthought. It is designed to transform water from a crisis sector into an opportunity sector.

Functions:

- Tracks progress on water investments.
- Unlocks finance for water projects.
- Aligns efforts across the G20, UN, multilateral development banks, and the private sector.
- Reports annually on the state of water investment.

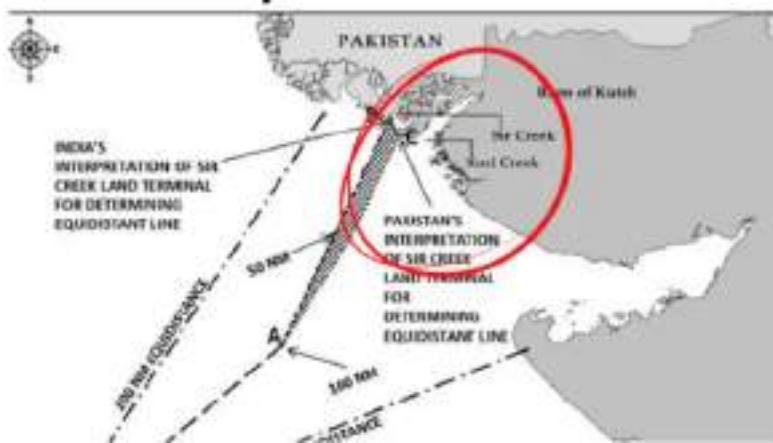
Hence, option (b) is the correct answer.

Q 92. B

- **Direct air capture (DAC) technologies extract CO₂ directly from the atmosphere at any location, unlike carbon capture which is generally carried out at the point of emissions, such as a steel plant.** The CO₂ can be permanently stored in deep geological formations or used for a variety of applications. **Hence, statement 1 is correct.**
- **Capturing CO₂ from the air is more energy intensive – and therefore more expensive – than capturing it from a point source.** This is because CO₂ in the atmosphere is much more dilute than, for example, in the flue gas of a power station or a cement plant. **Hence, statement 3 is not correct.**
- **Two technological approaches are currently used to capture CO₂ from the air: solid and liquid DAC.**
 - **Solid Sorbent DAC (S-DAC):** Air is passed over solid materials that chemically bind with CO₂. The sorbent is then heated to a temperature below 100°C to release the captured CO₂ for storage.
 - **Liquid Solvent DAC (L-DAC):** Air is exposed to a liquid solution that absorbs CO₂ and chemically converts it to solid carbonate pellets. A high temperature kiln (~900°C) is then used to break down the carbonate and release pure CO₂. **Hence, statement 2 is correct.**

- Q 93. C**
- eFuels are synthetically produced liquid fuels based on hydrogen and CO₂. By using CO₂ from the atmosphere and renewable energies, eFuels can be produced in a climate-neutral manner.
 - e-fuel production is done in two steps. In the first step, hydrogen is extracted from electrolysis of water through a renewable energy. In a second process step, with the aid of e.g. Fischer-Tropsch synthesis, the hydrogen is combined with CO₂ extracted from the air and converted into a liquid energy carrier.
 - After processing in refineries, this eFuel can be used as eGasoline, eDiesel, eHeating oil, eKerosene and eGas and can completely replace conventional fuels or can be blended with conventional fuel. eFuels can solve problems of storing and transporting renewable energies. Also, it has comparable energy density to conventional fuel like petrol. The climate neutrality of eFuels derives from the fact that electricity from renewable energies is used in their production and only as much CO₂ is emitted during use as was previously bound during production.
 - Advntages of eFuel:
 - eFuels have the same chemical properties as conventional fuels such as kerosene, petrol or diesel – and can completely replace them. Just like these fuels, eFuels have the highest energy density of all fuels.
 - Since the electricity used to produce eFuels comes from renewable energy sources (e.g. wind, solar or hydroelectric power), eFuels are climate-neutral. In addition, only natural resources such as water and CO₂ from the atmosphere are used.
 - eFuels can both be added to conventional fuels or can completely replace them.
 - Since the use of eFuels does not require any engines or systems to be converted, the 20,000 airplanes, 50,000 ships and more than 1.3 billion vehicles in existence today can continue to be used in the future in a climate-neutral manner that would otherwise not be possible. This also applies to around 20 million heating systems that run on liquid fuels. The essential logistics distribution and fuelling infrastructure already in place can continue to be operated in an economically efficient manner with eFuels. This does not change anything for consumers: the quick and safe supply and delivery of fuel they're used to remains the same
 - Hence the option (c) is the correct answer.

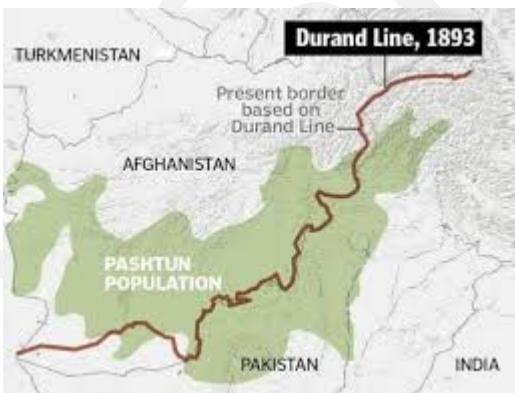
- Q 94. A**
- Sir Creek is a 96-km long tidal estuary in the marshlands of the Rann of Kutch. The boundary dispute over Sir Creek is between **India and Pakistan**, specifically separating the Gujarat state in India from the Sindh province in Pakistan. The determination of this land boundary is crucial as it affects the maritime boundary and Exclusive Economic Zones (EEZ) of both nations. **Hence, pair 1 is not correctly matched.**



- The **Blue Line** is a United Nations-drawn demarcation line that confirms Israel's withdrawal from southern Lebanon in 2000. It serves as the de facto border between Israel and Lebanon. It is not the primary demarcation line between Israel and Palestine, which is generally referred to as the Green Line (Armistice Line of 1949). **Hence, pair 2 is not correctly matched.**



- The **Durand Line** is the 2,670-kilometre (1,660 mi) international land border between **Pakistan and Afghanistan**. It was established in 1893 between British India and the Emirate of Afghanistan. It remains a major source of tension as Afghanistan's government has historically refused to recognize it as the legitimate international boundary. Hence, pair 3 is correctly matched.



Q 95. C .

- The Equator Prize, organized by the Equator Initiative within the United Nations Development Programme, is awarded biennially to recognize outstanding community efforts to reduce poverty through the conservation and sustainable use of biodiversity. As sustainable community initiatives take root throughout the tropics, they are laying the foundation for a global movement of local successes that are collectively making a contribution to achieving the Sustainable Development Goals (SDGs). **Hence, statement 1 is correct.**
 - The Equator Initiative Award is a prize from the United Nations Development Programme (UNDP) that recognizes local and indigenous communities for their achievements in conservation and

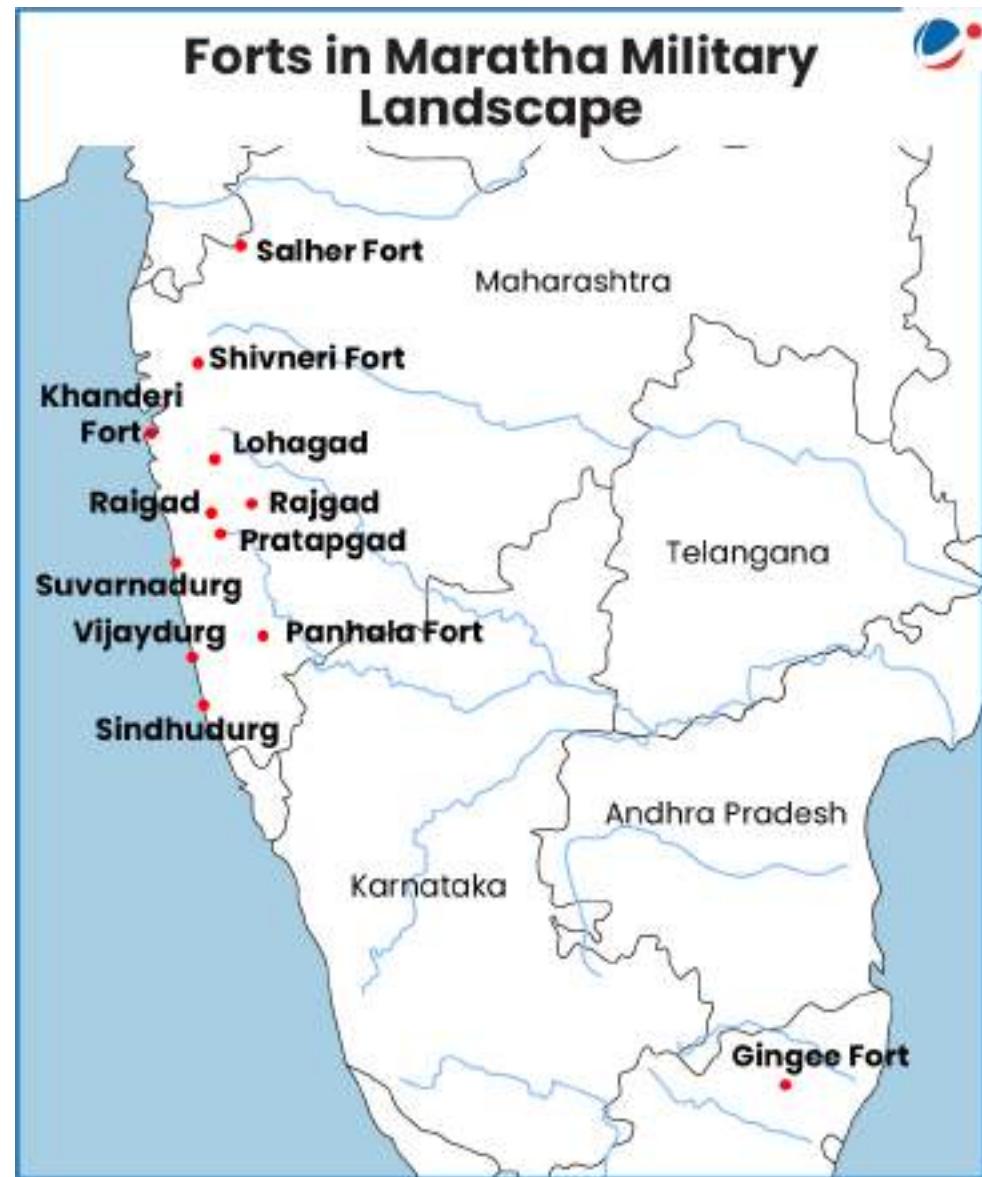
sustainable development. **Hence, statement 2 is correct.**

- It is also known as the Nobel Prize for Biodiversity Conservation and includes a cash prize of \$10,000. The 2025 award celebrated the Bibi Fatima Women's Self-Help Group from India for their work in sustainable farming and millet cultivation.

Q 96. A • Recently, Maratha Military Landscapes of India added to the UNESCO World Heritage List as the 44th site from India. **Hence, statement 1 is correct.**

- About Maratha Military landscape
 - It was placed on the Tentative List of World Heritage Sites in 2021.
 - Geographical Spread: States of Maharashtra and Tamil Nadu. Hence, statement 2 is not correct.**
 - Diverse and Strategic Locations: Situated across varied terrains, from coastal fortifications to hilltop strongholds, including the Sahyadri mountain ranges, the Konkan Coast, the Deccan Plateau, and the Eastern Ghats.
 - Evolution: 17th century during the reign of the Maratha King Chhatrapati Shivaji Maharaj and continued through subsequent rules until Peshwas in 19th centuries as strategic military vision and architectural ingenuity of the Maratha Empire.
 - Forts in Maratha Military Landscapes (12)

Forts in Maratha Military Landscapes (12)	Key Features
Sahib Hill fort	Witnessed an important battle in 1672 fought between the Marathas and the Mughals.
Shivneri Hill fort	Birth place of Chhatrapati Shivaji.
Lohagad Hill fort	Located near the Buddhist caves at Bhaja.
Rajgad Hill fort	<ul style="list-style-type: none"> Selected by Chhatrapati Shivaji for his permanent capital. Acted as the first capital of the Maratha Kingdom
Rajgad Hill fort	<ul style="list-style-type: none"> Rajgad, formerly known as Murumbadev (name based on the mountain Murumbadev, on which it was built). It was one of the 17 forts that Chhatrapati Shivaji Maharaj kept when he signed the Treaty of Purandar in 1655.
Gingee Hill Fort (Tamil Nadu)	It has three distinct hilltop citadels and a massive boundary of thick walls and cliffs.
Pratapgad Hill Forest Fort	Major fight with Afzal Khan took place near this fort.
Panhala Plateau Hill Fort	Became Maratha state capital under Tariq Ali.
Sindhudurg Island forts	Occupies an islet in the Arabian Sea.
Suvarnadurg Island forts	Presumably built by the rulers of Bijapur in the 16th century CE.
Khandesh Island forts	Built during the reign of the Maratha king Shivaji in 1679 CE to keep a check on the Siddhis at Murud-Janjira fort.
Vijaydurg Coastal Fort	<ul style="list-style-type: none"> Shivaji captured this fort from Adil Shah of Bijapur and renamed it as "VijayDurg". It was called the "Eastern Gibraltar".



- Q 97. A**
- Methane is a powerful greenhouse gas and short-lived climate pollutant (SLCP) primarily emitted by human activities. It has an atmospheric lifetime of around 12 years.
 - Methane has anthropogenic (human-caused) and natural sources. **Over 60% of methane emissions come from human activity. Natural processes account for 40% of methane emissions, with wetlands being the largest natural source.** More than 90% of global anthropogenic methane emissions stem from three sectors. **Hence, statement 1 and 2 are correct.**
 - The main methane emitting sectors are:**
 - Agriculture (40%), including from livestock rearing, animal manure, and rice production.** Hence, Agriculture is the largest human source of methane emissions, responsible for 40%. **Hence, statement 3 is not correct.**
 - Fossil fuels (35%), including through leakage from natural gas and oil production and distribution systems, and coal mines.**
 - Waste (20%), from food and other organic materials left in landfills, open dumps, and wastewater.**

- Q 98. D**
- Carbon credits are tradable permits representing one metric ton of carbon dioxide equivalent that has been either removed from or prevented from entering the atmosphere. **They operate on a Cap-**

and-Trade system. They are generated by projects that reduce greenhouse gas emissions, such as renewable energy, reforestation, or energy efficiency initiatives. Organisations can buy carbon credits to offset their own emissions or to comply with regulations. **Hence, statements 1 and 2 are correct.**

- **The Energy Conservation (Amendment) Act, 2022 provided the legal basis for India's carbon market.** The Act empowers the central government to establish a carbon credit trading scheme by specifying the necessary regulations and procedures for issuing and trading carbon credit certificates. This creates a framework for reducing emissions and incentivizing climate action, incorporating both compliance markets for obligated entities and voluntary offset mechanisms.
- **Carbon credits are financial instruments that can be traded on specialized carbon markets, which include both compliance (mandatory) and voluntary markets. The price is determined by market forces like supply and demand.** While individual credits are typically traded on specific commodity exchanges (like the Multi Commodity Exchange in India), investors can gain exposure to the carbon market through brokerage services and exchange-traded funds (ETFs) that hold carbon-related company stocks or carbon credit futures contracts. **Hence, statement 3 is correct.**

- Q 99. C**
- **The Climate and Clean Air Coalition (CCAC) has launched an online platform- Air Quality Management Exchange Platform (AQMX) that aims to serve as a ‘one stop shop’ for technical tools and models, data, and knowledge to build capacity among air quality managers worldwide.** The platform provides the latest air quality management guidance and tools proposed to meet the interim targets of the World Health Organization’s (WHO) Air Quality Guidelines.
 - The Air Quality Management Exchange Platform will work directly with air quality managers, to help address air quality management capacity gaps by providing curated guidance across key themes, including on air quality monitoring, inventory development, and health impact assessments.
 - The platform was developed in response to Resolution 6/10, adopted by the UN Environment Assembly (UNEA) on 1 March 2024. Titled, ‘Promoting Regional Cooperation on Air Pollution to Improve Air Quality Globally,’ the resolution calls for increased global cooperation to tackle air pollution by sharing best practices, tools, data, and information. **Hence, option (c) is the correct answer.**

- Q 100. C**
- **Solid Waste Management Rules, 2016:**
 - **The Ministry of Environment, Forest and Climate Change shall be responsible for overall monitoring the implementation of these rules in the country.** It shall constitute a Central Monitoring Committee under the Chairmanship of Secretary, Ministry of Environment, Forest and Climate Change. Hence, statement 1 is not correct.
 - **Some of the salient features of The Solid Waste Management (SWM) Rules, 2016 include:**
 - The Rules are now applicable beyond Municipal areas and extend to urban agglomerations, census towns, notified industrial townships, areas under the control of Indian Railways, airports, airbase, Port and harbour, defence establishments, special economic zones, State and Central government organizations, places of pilgrims, religious & historical importance.
 - **The bio-degradable waste should be processed, treated and disposed of through composting or bio-methanation** ("bio-methanation" means a process which entails enzymatic decomposition of the organic matter by microbial action to produce methane rich

biogas) within the premises as far as possible. The residual waste shall be given to the waste collectors or agency as directed by the local authority. **Hence, statement 3 is correct.**

- **Responsibility of generators has been introduced to segregate waste into three categories – Wet, Dry and Hazardous Waste. Hence, statement 2 is correct.**
- Waste generator will have to pay ‘User Fee’ to waste collector and for ‘Spot Fine’ for Littering and Non-segregation.

Copyright © by Vision IAS

All rights are reserved. No part of this document may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior permission of Vision IAS.