Test Booklet Series

TEST BOOKLET

C

GENERAL STUDIES (P) 2026 – Test – 6317

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. The transition zone of varied natural vegetation occupying the boundary between two adjacent and differing plant communities is known as:

(a) ecological niche
(b) climax
(c) ecological succession
(d) Ecotone

2. With reference to Navigation with Indian Constellation (NAVIC), consider the following statements:

1. It is a regional navigation satellite system that consists of a constellation of seven satellites.
2. It provides accurate real-time positioning and timing services over India and the region around it extending to 1,500 km.
3. It will provide services for both civilian and military purposes.

How many of the statements given above are correct?

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

3. With reference to carbon cycle, consider the following statements:

1. Carbon is the most abundant element in the earth's crust.
2. On Earth, most carbon is stored in the ocean and atmosphere rather than in rocks and sediments.
3. The amount of carbon in the earth's carbon cycle is increasing due to excessive use of fossil fuels.

How many statements given above are correct?

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

4. E-Waste (Management) Rules 2016 was notified under which of the following Acts?

(a) Air (Prevention and Control of Pollution) Act, 1981
(b) Biological Diversity Act, 2002
(c) Environment (Protection) Act, 1986
(d) Ozone Depleting Substances Rules, 2000

5. With reference to the National Forest Policy of 1988, consider the following statements:

1. It mandates that more than half of the total land area of the country should be under forest cover.
2. It promotes the use of degraded lands for plantation purposes.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neithetr 1 nor 2

6. Consider the following statements:

1. Organisms which can tolerate and thrive in a wide range of temperatures are called ‘Stenothermal’ .
2. Organisms which restrict themselves to a narrow range of temperature are called 'Eurythermal'.

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

7. Excessive use of which one of the following chemicals in drinking water can cause Blue baby’ syndrome?

(a) Nitrate
(b) Cadmium
(c) Fluoride
(d) Arsenic

8. With reference to the radioactive pollution, consider the following statements:

1. Radioactive wastes are short term pollutants that can remain radioactive for a few hours.
2. Radioactive dust can remain at altitudes as high as 3000 meters.
3. X-ray machines at airports are a source of radioactive pollution.

Which of the statements given above is/are **not** correct?

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

9. With reference to Genetic Biodiversity, consider the following statements:

1. It refers to the variation of genes within species, including differences among individuals and populations.
2. Higher genetic biodiversity enhances the ability of species to adapt to environmental changes.

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

10. Homeostasis in living organisms refers to which of the following?

(a) The tendency of an organism to maintain internal stability despite external environmental changes.
(b) A behavioral response where an organism migrates to maintain favorable living conditions.
(c) The process of entering a dormant state to escape stressful environmental conditions.
(d) The directional movement of nutrients through different trophic levels in an ecosystem.

11. Consider the following statements regarding Biomedical Waste Management Rules 2016:

1. It applies only to hospitals with surgical facilities.
2. Biomedical waste has to be segregated into two categories, i.e, hazardous and non-hazardous waste.

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

12. The term "Dark Factories," recently mentioned in the context of future industrial trends, refers to:

(a) underground manufacturing hubs designed to prevent industrial espionage.
(b) environmentally sustainable factories powered only by renewable energy sources.
(c) fully automated manufacturing facilities that operate without human intervention using robotics and AI.
(d) informal and unregulated production units operating in developing countries.

13. Which of the following is/are greenhouse gases (GHG)?

1. Water vapor
2. Carbon Dioxide
3. Nitrous Oxide

Select the correct answer using the code given below.

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

14. The term "twister" is often discussed in the context of a:

(a) massive oceanic wave caused by underwater volcanic activity.

(b) violent, funnel-shaped column of air extending from a thundercloud to the ground.

(c) rotating dust storm commonly found in arid regions of the Middle East.

(d) type of atmospheric cyclone that forms over polar ice caps.

15. The Zangezur Corridor, recently in the news, is strategically significant because it:

(a) connects Armenia directly to Russia through the Caspian Sea, bypassing Azerbaijan.

(b) aims to link Azerbaijan's mainland to Turkey via Armenia.

(c) provides China with direct access to the Mediterranean through Iran.

(d) establishes a new maritime trade route connecting the Persian Gulf to the Black Sea.

16. North Atlantic Treaty Organization's (NATO) Parliamentary Assembly recently arrived at Dayton (Ohio, USA) where the Dayton Peace Agreement was reached at. In this context, "Dayton Peace Agreement" is related to the resolution of conflict in which one of the following regions?

(a) Palestine and Israel

(b) Northern Ireland

(c) Bosnia and Herzegovina

(d) Rwanda

17. Which of the following is an example of a foundation species?

(a) A beaver building a dam that creates a pond

(b) A top predator regulating the population of prey species

(c) An invasive species outcompeting native vegetation

(d) A decomposer breaking down organic matter in soil

18. Which of the following statements regarding Biodiversity Heritage Sites is correct?

(a) These sites are notified by the State Government under the Wild Life (Protection) Act, 1972.

(b) Richness of domestic species is the only criterion for declaring BHS.

(c) Areas that contain sustainable agricultural practices could be declared as BHS.

(d) Central Government in consultation with the State Government may frame rules for the management and conservation of BHS

19. With reference to different levels of organization in Ecology, consider the following statements:

1. Population consists of individuals of the same species living and interacting in a given area.
2. Community refers to populations of different species living together and interacting in a particular area.
3. Biome is a large regional ecosystem characterized by similarity in vegetation and climate.

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

20. With reference to Gig Workers in India, consider the following statements:

1. Gig workers include individuals engaged in temporary, flexible jobs often facilitated by digital platforms.
2. They can be broadly classified into platform and non-platform-based workers.
3. Gig workers have never been defined in any act in India.

Which of the statements given above is/are correct?

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

21. Consider the following statements regarding the 'Biodiversity Heritage Sites' (BHS):

1. Richness of domestic species is one of the criteria for declaring BHS.
2. Areas that contain significant domesticated biodiversity components can be declared as BHS.

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

22. The USA President aborted the move to rename the Persian Gulf as the 'Arabian Gulf' or 'Gulf of Arabia'. In this regard, how many of the following countries have a border with the Persian Gulf?

1. UAE
2. Oman
3. Kuwait
4. Yemen
5. Syria

Select the correct answer using the code given below.

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

23. Which of the following statements regarding biodiversity in temperate and tropical regions is correct?

(a) Tropical regions have been subjected to frequent glaciations in the past while temperate latitudes have remained undisturbed.
(b) Temperate environments are less seasonal and stable thus promoting niche specialisation.
(c) There is more solar energy available in the temperate, which contributes to higher productivity.
(d) None

24. Consider the following differences between Predation and Parasitism:

1. A predator kills its prey, whereas a parasite usually does not kill the host.
2. In predation, the strong feed on the weak, while in parasitism, the weak feed on the strong.

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

25. Which of the following statements best describes the Gamma-diversity?

(a) Species richness in a particular ecosysytem.
(b) Difference in species richness between two different habitats or within a single community at different points in time
(c) Total biodiversity within an entire region.
(d) None

26. It is located in the Mayurbhanj district of Orissa state of India. This National Park comprises dense Sal forest due to which this park has been chosen for the Project Tiger. The fauna of this national park includes tigers, elephants, deer, pea foul, talking mainas, chital, sambhar, panther, gaur, hyenas, and sloth beer.

The above paragragh best describes which of the following national park of India?

(a) Kaziranga National Park
(b) Simlipal National Park
(c) Ranthambore National Park
(d) Kanha National Park

27. Which of the following explains that if two species have almost completely overlapping niches they cannot continue to coexist?

(a) Allen's rule
(b) Gause's Hypothesis
(c) Gloger's rule
(d) Jordon's rule

28. Recently, MLA was disqualified after being convicted by a CBI court. Which of the following disqualification conditions are mentioned in the constitution for an MP or MLA?

1. Holding Office of Profit
2. Involvement in corrupt practices
3. Person of unsound mind
4. Conviction for two years or more in crimes like bribery, rape, promoting enmity, or untouchability
5. An undischarged insolvent

Select the correct answer using the code given below.

(a) 1, 2 and 3 only
(b) 3, 4 and 5 only
(c) 1, 3 and 5 only
(d) 1, 2, 3, 4 and 5

29. The term "predatory pricing," often seen in the news is refers to:

(a) charging excessively high prices to exploit consumers in a monopoly.
(b) offering free goods and services to increase brand visibility.
(c) setting prices artificially low to eliminate competitors and establish market dominance.
(d) colluding with other firms to fix prices in a particular industry.

30. Consider the following regarding the Bharat Forecast System:

1. It is a next-generation weather forecasting model developed indigenously by Indian Institute of Tropical Meteorology (IITM), Pune.
2. India is the only country operating a global forecast system at a high resolution in real time..

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

31. Consider the following statements regarding Kumbakonam Vetrilai (Betel Leaf):

1. It is a unique variety of betel leaf grown in the region of Karnataka.
2. It has been granted the Geographical Indication (GI) tag for its distinct aroma and taste.

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

32. Which of the following is an example of invasive species?

(a) Rossy wolf snail
(b) Carrot grass
(c) Water hyacinth
(d) All of the above

33. With reference to bioremediation consider the following statements:

1. It is the application of biotic agents like microorganisms in the correction and recovery of environmental damage.
2. Ionic elements from radioactive waste can be treated with bioremediation techniques.

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

34. Minister of Defence Urged International Atomic Energy Agency (IAEA) Oversight of Pakistan's Nuclear Arsenal. In this context, consider the following statements regarding the International Atomic Energy Agency (IAEA):

1. It was established as an autonomous organisation under the United Nations.
2. It is a member of the Non-Proliferation of Nuclear Weapons Treaty.

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

35. Consider the following statements regarding the Mahadayi River:

1. It originates in the Western Ghats in the state of Karnataka.
2. It is non-perennial and depends entirely on monsoon rainfall.

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

36. Consider the following statements with reference to the Indian Forest Act, 1927:

1. It regulates the duty leviable on forest produce.
2. It introduced the concept of Reserved Forest.
3. The Central Government can assign community rights to any village over any land of a reserve forest.

Which of the statements given above is/are correct?

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

37. Consider the following statements with respect to Trade Records Analysis of Flora and Fauna in International Commerce (TRAFFIC) :

1. It has been established under the aegis of the International Union for Conservation of Nature (IUCN) and the World Wide Fund for Nature (WWF).
2. It is concerned with the monitoring of both legal as well as illegal trade in wildlife across the world.

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

38. With reference to the Insolvency and Bankruptcy Code (IBC), 2016, consider the following statements:

1. It is the umbrella legislation for insolvency resolution of all entities in India, both corporate and individual.
2. The National Company Law Appellate Tribunal is the highest appellate authority for insolvency of companies and limited liability partnerships (LLPs).
3. It does not provide any maximum time limit for completion of the insolvency resolution process.

How many of the statements given above are correct?

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

39. Which of the following is not the ex-situ methods of biodiversity conservation?

(a) Botanical Garden
(b) Zoo
(c) Biosphere Reserves
(d) Aquariums

40. Which of the following protocols/conventions aims to improve air quality across borders and specifically addresses the abatement of acidification, eutrophication and ground-level ozone?

(a) Gothenburg Protocol
(b) Minamata Convention
(c) Cartagena Protocol
(d) Bonn Convention

41. Consider the following statements with respect to the National Adaptation Fund For Climate Change (NAFCC):

1. It was launched as a result of the Rio Declaration on Environment and Development.
2. The Ministry of Environment, Forest and Climate Change is the nodal implementing agency of NAFCC.

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

42. As per the recent World Economic Outlook of the IMF, arrange the following countries in decreasing order of their share in world GDP.

1. India
2. Germany
3. United Kingdom
4. Japan

Select the correct answer using the code given below.

(a) 1-2-3-4
(b) 1-3-2-4
(c) 2-1-4-3
(d) 4-1-3-2

43. Consider the following statements regarding Fibre Optic Drones:

1. Fibre optic drones are connected to their base station via a cable during flight.
2. These drones are resistant to electronic jamming, unlike other drones.
3. They are widely used in long-range surveillance missions and military reconnaissance.

Which of the statements given above is/are correct?

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

44. Which of the following national parks is ***not*** included in the list of UNESCO World Heritage natural sites?

(a) Kaziranga National Park
(b) Keoladeo National Park
(c) Sundarbans National Park
(d) Pench National Park

45. Consider the following ecological pyramids:

1. Pyramid of numbers in a parasitic food chain
2. Pyramid of biomass in a grassland ecosystem
3. Pyramid of biomass in a pond ecosystem

How many of the above ecological pyramids are usually inverted?

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

46. Israel launched a strike on Hodeida and al-Salif ports, in which sea the ports are located?

(a) Red Sea
(b) Mediterranean Sea
(c) Black Sea
(d) Persian Gulf

47. Which of the follwoing species of vultures is ***not*** critically endangered?

(a) Himalayan Vulture
(b) Slender-Billed Vulture
(c) White-Rumped Vulture
(d) Red-Headed Vulture

48. With reference to aquatic ecosystems, consider the following statements:

1. In aquatic ecosystems, the grazing food chain generally begins with phytoplankton.
2. The detritus food chain is completely absent in open ocean ecosystems.
3. Zooplankton serve as primary consumers in the grazing food chain.

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

49. Consider the following pairs:

Sacred Grove		**State**
1. Sarna	:	Bihar
2. Lai Umang	:	Manipur
3. Oran	:	Rajasthan

Which of the pairs given above are correctly matched?

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

50. Which of the following is/are correct about a national park in India?

1. An area within a sanctuary can be notified as a national park.
2. No human activity is permitted inside the national park except for the ones permitted by the Chief Wildlife Warden of the state.

Select the correct answer using the code given below.

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

51. Consider the following statements about the Water (Prevention and Control of Pollution) Act,1974:

1. It provides for the maintenance and restoration of surface water only and not groundwater.
2. It authorizes the Central Pollution Control Board to implement the work for the objectives of the Act.

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

52. Which among the following gases has the highest Global Warming Potential (GWP)?

(a) Carbon dioxide (CO_2)
(b) Sulfur hexafluoride (SF_6)
(c) Nitrous oxide (N_2O)
(d) Methane (CH_4)

53. Consider the following pairs:

Biotic Interaction		**Example**
1. Predation	:	Pitcher plant consuming insect
2. Competition	:	Plants in an evergreen forest
3. Amensalism	:	Sparrow eating seeds

How many of the above pairs are correctly matched?

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

54. Consider the following pairs:

Type of Biodiversity		**Measure of**
1. Alpha diversity	:	Change in amount of species between the ecosystems
2. Beta diversity	:	Species richness in a particular ecosystem
3. Gamma diversity	:	Total biodiversity within an entire region

How many of the above pairs are correctly matched?

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

55. Consider the following statements:

1. Photochemical smog is a mixture of pollutants that are formed when nitrogen oxides and volatile organic compounds (VOCs) react to sunlight, creating a brown haze above cities.
2. Photochemical smog is an oxidising smog.

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

56. Consider the following:

1. Fly ash from thermal power plants
2. Electronic waste
3. Mining operations
4. Fertilisers and pesticides
5. Domestic garbage dumped on land

How many of the given factors are responsible for soil pollution?

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

57. Which among the following is the core National Implementing Entity for National Adaptation Fund For Climate Change in India?

(a) NITI Aayog
(b) National Biodiversity Authority
(c) National Afforestation and Eco-Development Board
(d) National Bank for Agriculture and Rural Development (NABARD)

58. Consider the following pairs:

Conservation Movement		**State**
1. Chipko	:	Rajasthan
2. Silent Valley Movement	:	Kerala
3. Appiko	:	Uttarakhand

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

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

59. With reference to the Environmental Impact Assessment, consider the following statements:

1. Environmental Clearance (EC) is mandatory for new projects or modernization under the Air (Prevention and Control of Pollution) Act, 1981.
2. All industries are mandated to comply with the Environmental Impact Assessment (EIA) requirements regardless of the investment value of their projects

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

60. Consider the following statements regarding GRAIL Mission:

1. The GRAIL Mission was launched to study the moon's gravitational field.
2. The mission was carried out by ISRO in collaboration with the European Space Agency (ESA).

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 biodiversity conservation sites:

1. National Parks
2. Wildlife safari parks
3. Biosphere Reserves
4. Zoological Parks

How many of the above are examples of in-situ conservation approaches?

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

62. Which among the following best describes Allen's Rule?

(a) It states that organisms in colder climates have larger surface area to volume ratios.
(b) It says mammals in colder climates tend to have shorter limbs and appendages to reduce heat loss.
(c) It explains competition between closely related species over time.
(d) It describes the ecological succession in tundra biomes.

63. In the context of zoonotic diseases, consider the following statements:

1. They are infectious diseases transmitted from animals to humans.
2. Zoonoses can be caused only by viruses and bacteria.
3. The Northeast region contributed to higher zoonotic disease outbreaks compared to the Southern region.

How many of the statements given above are correct?

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

64. Which of the following conventions specially deals globally with the prevention of marine pollution by dumping of wastes and other matter?

(a) Minamata Convention, 2013
(b) London Convention, 1972
(c) Vienna Convention, 1985
(d) Bonn Convention, 1979

65. Consider the following:

1. Long legs and ears
2. Nocturnal nature
3. Producing concentraed urine

How many of the above are adaptations of the desert animals to survive the extreme heat?

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

66. With reference to Eutrophication, which of the following statements is/are correct?

1. It is a manmade process and does not occur naturally.
2. The prime eutrophication contaminants are nitrates and phosphates.
3. It restricts the growth of plants in the aquatic environment.

Select the correct answer using the code given below.

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

67. Consider the following statements with regard to the harmful effects of chemicals in drinking water:

1. Deficiency of Fluorine in drinking water causes tooth decay.
2. High concentration of Lead in drinking water can damage the kidney and liver.

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

68. Consider the following statements regarding biomagnification:

1. It refers to the increase in concentration of toxic substances from lower to higher trophic levels.
2. Fat-soluble substances are more prone to biomagnification.
3. It usually affects primary producers the most.

How many of the above statements are correct?

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

69. Which of the following are criteria used to identify bodiversity hotspots?

1. Species richness
2. High endemism
3. Threat perception

Select the correct answer using the code given below.

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

70. Consider the following statements about the Wildlife Protection Act, 1972:

1. It provides for the appointment of Chief Wildlife Warden by the Central Government.
2. It promotes both in-situ and ex-situ conservation areas
3. It was enacted for the protection of only animal species.

Which of the statements given above is/are correct?

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

71. With respect to Panchamrita strategy of India's climate action consider the following statements:

1. It aims to attain the target of 500 GW of non-fossil energy capacity by 2030.
2. Its target is to achieve net-zero emissions by 2070.

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

72. Consider the following statements about the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES):

1. The CITES Secretariat is administered by IUCN.
2. It is non-binding on the countries ratifying it.

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

73. Which of the following statements about earth's biodiversity is correct?

(a) More than 70 per cent of all the species recorded are animals.
(b) Among animals, reptiles are the most species-rich taxonomic group.
(c) As per the IUCN, so far 15 million species have been described.
(d) The number of fungi species in the world is less than the total of the species of fishes.

74. The process of using fungi to break down hazardous pollutants in the environment is referred to as:

(a) Phytoremediation
(b) Mycoremediation
(c) Bioleaching
(d) Vermicomposting

75. Consider the following statements with reference to Sacred Groves :

1. It is safeguarded by indigenous communities as spiritual or cultural sanctuaries.
2. Any form of human disturbance is prohibited to preserve their untouched and natural state.

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

76. Consider the following statements about Central Zoo Authority:

1. It was established under the Environment Protection Act 1986
2. It regulates the exchange of animals of the endangered category among zoos.

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

77. It refers to the diversity within a single species. This diversity is crucial for species adaptation to changing environments , ensuring survival through significant environmental changes.

The above passage reflects which type of biological diversity?

(a) Genetic diversity
(b) Species diversity
(c) Ecological diversity
(d) None

78. Consider the following statements regarding the Sustainable Development Goals (SDGs):

1. Sustainable Development Goal-13 deals with climate action.
2. The SDG India Index is released by the Ministry of Statistics and Programme Implementation.

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

79. It located in the Sahyadri Ranges of Western Ghats, was established in January 2010 and straddles Kolhapur, Satara, Sangli, and Ratnagiri districts in western Maharashtra. It comprises of rich evergreen, semi-evergreen and moist deciduous forests. It is the first Tiger Reserve of Western Maharashtra and the fourth Tiger Reserve of the State spreading over two Protected Areas of Koyana Sanctuary (KWLS) and Chandoli National Park (CNP).

The above passage decribes which of the following tiger reserve?

(a) Tadoba-Andhari Tiger Reserve
(b) Sahyadri Tiger Reserve
(c) Melghat Tiger Reserve
(d) Pench Tiger Reserve

80. Which one of the following is the correct sequence of a food chain?

(a) Dinoflagellates-Herrings-Copepods
(b) Herrings-Dinoflagellates-Copepods
(c) Copepods-Herring-Dinoflagellates
(d) Dinoflagellates-Copepods-Herring

81. With reference to the 'Wildlife (Protection) Amendment Act, 2022', consider the following pairs:

List-I (categories)		**List-II (Status)**
1. Schedule-I	:	Animal Species with the highest level of protection.
2. Schedule-II	:	Plant Specimen listed in the Appendices under CITES
3. Schedule-III	:	Animal Species with a lesser level of protection.

How many pairs given above are correctly matched?

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

82. Consider the following statements with reference to Joint Forest Management:

1. It is the model of forest management where both the state government and central government are involved in planning and conservation programmes.
2. It was first recognized under the National Forest Policy 1988.

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. Clean Development Mechanism, Joint Implementation and International Emission Trading are the parts of which one of the following?

(a) Montreal Protocol
(b) Paris Agreement
(c) Kyoto Protocol
(d) Nagoya Protocol

84. With reference to 5th generation fighter jet aircraft, consider the following pairs:

Aircraft Type		***Country***
1. F-35	:	France
2. Su-57	:	Russia
3. J-20	:	Japan

How many of the pairs are correctly matched?

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

85. Consider the following statements regarding the regulation for noise pollution in India:

1. The Central Pollution Control Board has laid down the permissible noise levels in India for different areas.
2. An area within 2 kilometers of the premises of hospitals, educational institutions and courts may be declared as a silence zone.

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

86. Consider the following statements with respect to Acid rain:

1. Acid rain is the result from the emission of oxides of sulphur and nitrogen.
2. Acid rain has a pH value below 5.6.
3. Acid rain corrodes water pipes resulting in the leaching of heavy metals into drinking water.

How many of the statements given above are correct?

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

87. Which of the following statements about Ozone is/are ***not*** correct?
ozone is a greenhouse gas.

1. Ozone is thermodynamically stable than oxygen.
2. Tropospheric ozone is a greenhouse gas.
3. In the stratosphere, it forms a shield protecting us from the UV radiation of the sun.

Select the correct answer using the code given below.

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

88. Consider the following statements with respect to ozone depletion:

1. Chlorofluorocarbons (CFCs) are very toxic organic molecules that cause ozone depletion.
2. Polar stratospheric clouds provide a surface for the reactions causing ozone depletion.
3. Free Chlorine radicals form when CFCs are broken down by UV radiations.

How many of the above given statements are correct?

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

89. Which of the following harmful materials are found in e-waste?

1. Dioxin
2. Furan
3. Cadmium
4. Chromium

Select the correct answer using the code given below.

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

90. Recently, the scientists studied the structure of liquid carbon for the first time using in situ X-ray diffraction. In this context, consider the following statements regarding liquid carbon:

1. It requires temperatures below -40 °C and pressures over several megapascals to exist.
2. It can be found naturally in the interior of planets.

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

91. Which of the following best describes the "DHRUVA initiative" recently seen in the news?

(a) It is a centralised biometric identification system for all Indian citizens.
(b) It is a unique geocoded digital address to every home in India for improved service delivery.
(c) It is an initiative to digitise traditional post offices into multi-purpose banking and insurance hubs.
(d) It is an initiative to map and digitise rural road infrastructure under the Pradhan Mantri Gram Sadak Yojana.

92. Consider the following statements regarding the Globally Important Agricultural Heritage Systems (GIAHS) programme:

1. It is an UNESCO initiative aimed at identifying and conserving agricultural heritage worldwide.
2. It includes systems that are both land-based and aquatic based agricultural heritage sites.
3. India has no sites under the Globally Important Agricultural Heritage Systems programme.

How many of the statements given above are correct?

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

93. The term "Distributed Denial-of-Service (DDoS)", often mentioned in the context of cybersecurity, refers to a/an:

(a) technique used to recover lost data from encrypted systems.
(b) attack where multiple systems overwhelm a target server or network, making it inaccessible to legitimate users.
(c) type of malware that steals user credentials from banking applications.
(d) method of secure communication between distributed cloud services.

94. Consider the following statements with reference to the Compensatory Afforestation Fund:

1. It is established by an act passed by the Parliament.
2. It is placed under the Public Account of India.
3. The national fund receives more than half of the total Compensatory Afforestation fund.

How many of the statements given above are correct?

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

95. Which one of the following institutions developed the "Economic Capital Framework" in India?

(a) Ministry of Finance, Government of India
(b) Reserve Bank of India (RBI)
(c) NITI Aayog
(d) Securities and Exchange Board of India (SEBI)

96. With reference to ecological succession, which of the following statements is ***not*** correct?

(a) Primary succession can begin on surfaces like bare rock, lava, or sand dunes.
(b) Secondary succession can be observed in areas affected by floods, forest fires, or agriculture.
(c) In ecological succession, species diversity typically decreases over time.
(d) A climax community is relatively stable and in equilibrium with the climate of the region.

97. In the context of ecology, Amensalism refers to:

(a) an interaction where both species are harmed.
(b) a relationship in which one species is inhibited while the other is unaffected.
(c) an association where both species benefit.
(d) a relationship in which one organism is benefited by direct utilization of another.

98. Consider the following statements:

1. Bioprospecting is the systematic search for biochemical and genetic information in nature in order to develop commercially valuable products for pharmaceutical, agricultural, cosmetic and other applications.
2. Bio-piracy is the illegal collection and patenting of the biological materials originally belonging to some other community, state, or nation.

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

99. Which of the following best describes the process of phytoremediation in the context of environmental management?

(a) The use of microorganisms to clean up oil spills and other environmental pollutants.
(b) The use of green plants to absorb, degrade, or contain contaminants from soil, water, or air.
(c) The production of biodegradable plastics using plant-derived polymers.
(d) The large-scale clearance of forests for cultivation of biofuel-producing crops.

100. Which one of the following terms best describes the concept of "Intrinsic Bioremediation"?

(a) The technique uses plants to remove, stabilize, or detoxify pollutants.
(b) Increase in concentration of a substance within a trophic level in certain tissues of organisms' bodies due to absorption from food and the environment.
(c) The technique of increasing the ability of native microbes on the contaminated site to degrade pollutants through the addition of a natural or manufactured population of microorganisms.
(d) Increase in concentration of a chemical or pesticides in the bodies of consumers as one moves up the food chain.

ANSWERS & EXPLANATIONS
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Q 1.D

- An ecotone is a transitional area between two biological communities or ecosystems.
- It contains species from both adjacent communities, and often has unique species adapted to the transition conditions.
- **Examples:**
  - The mangrove forests (transition between land and sea).
  - Grassland–forest boundary, where both grassland and forest species co-exist.
- **Ecotones are known for their high biodiversity due to this overlap — a phenomenon called the "edge effect." Hence, option (d) is the correct answer.**
- Ecological succession refers to the gradual process of change in the species structure of an ecological community over time. It's about temporal change, not a spatial boundary between two communities.
- A niche is the functional role a species plays in its ecosystem (what it eats, how it reproduces, where it lives, etc.). It's about what a species does, not a geographic boundary between communities.
- A climax community is the final, stable stage in ecological succession. It represents mature, stable ecosystems in equilibrium with the environment, not a transitional zone.

Q 2.C

- **Context: NavIC played a crucial role in the success of Operation Sindoor**
- **It is ISRO's** regional navigation satellite system called Navigation with Indian Constellation (NavIC). NavIC was erstwhile known as Indian Regional Navigation Satellite System (IRNSS).
- **NAVIC (Navigation with Indian Constellation) is India's indigenous global navigation satellite system. Consisting of a constellation of three geostationary, four geosynchronous (total 7 satellites).**
- **NAVIC will facilitate accurate real-time positioning and timing services over India and the region around it extending to 1,500 km.**
- **NavIC SPS signals are interoperable with the other global navigation satellite system (GNSS) signals namely GPS, Glonass, Galileo and BeiDou.**
- It will provide two services:
  - Free service for the use of civilians. This service is called Standard Positioning Service (SPS) and will have an accuracy of up to 20 metres.
  - Strongly encrypted service for military use. This is called Restricted Service (RS) and will have an accuracy of up to 10 cm.
- **Few applications:**
  - Transportation (terrestrial, aerial and marine)
  - Location based services
  - Personal mobility
  - Resource monitoring
  - Surveying and geodesy
  - Scientific research
  - Time dissemination and synchronisation
  - Safety-of-life alert dissemination
- **Hence all the statements are correct.**

Q 3.D

- The carbon cycle involves the exchange of carbon between the atmosphere and organisms. It is the biogeochemical cycle by which carbon is interchanged among the biosphere, hydrosphere, atmosphere, and geosphere of the Earth. It is a gaseous cycle.
- **As our planet and its atmosphere form a closed environment, the amount of carbon in this system does not change.** Wherever the carbon is located in the atmosphere or on Earth, it is constantly in flux or motion. **Hence statement 3 is not correct.**
- **Most carbon on earth is stored in rocks and sediments,** while the rest is located in the ocean, atmosphere, and living organisms. These are the reservoirs, or sinks, through which the carbon cycles. **Hence statement 2 is not correct.**
  - Carbon from the atmosphere is taken up by the green plants by photosynthesis and then to animals by the food chain.
  - By respiration and decomposition of dead organic matter, it returns to the atmosphere.
- **Although widely distributed in nature, carbon is not particularly plentiful—it makes up only about 0.025 percent of Earth's crust—**yet it forms more compounds than all the other elements combined. The most abundant element in the earth's crust is oxygen (46.1%). Silicon is second, making up 28%, followed by aluminum (8%), iron (5%), magnesium (2%), calcium (4%), sodium (3%), and potassium (3%). **Hence statement 1 is not correct.**

Q 4.C

- **The Environment Protection Act of 1986** is a significant legislation in India that focuses on the prevention, control, and abatement of environmental pollution.
- EPA empowers the Government to plan and execute a nationwide programme for the prevention, control, and abatement of environmental pollution. Lay down standards for the quality of the environment in its various aspects, like the emission or discharge of environmental pollutants from various sources.
- The Central government has notified Solid Waste Management Rules 2016, Hazardous and Other Wastes (Management & Transboundary Movement) Rules 2016, Plastic Waste Management Rules 2016, E-Waste (Management) Rules 2016, and Bio-Medical Waste Management Rules, 2018 under **the Environment (Protection) Act, 1986**. **Hence option (c) is the correct answer.**

Q 5.B

- National Forest Policy (NFP) 1988 envisages that 33% of the geographical area should be under forest or tree cover. **Hence statement 1 is not correct.**
- **Salient features of the National Forest Policy are :**
  - Maintenance of environmental stability and restoration of ecological balance.
  - Conservation of natural heritage.
  - Checking soil erosion and denudation.
  - Increasing substantially the forest/tree cover.
  - Meeting the requirements of fuelwood, fodder, NTFP, and small timber.
  - Increasing the productivity of forests.
  - Encouraging efficient utilisation of forest produce and maximising substitution.
  - Creating a massive people's movement, especially with the involvement of women.
  - It provides for compensatory afforestation where non-forest land is afforested to compensate for the loss of forest land.
  - It states that the diversion of forest land for any non-forest purpose should be subject to the most careful examination by specialists from the standpoint of social and environmental costs and benefits. Construction of dams and reservoirs, mining and industrial development, and expansion of agriculture should be consistent with the need for the conservation of trees and forests. Projects which involve such diversion should at least provide in their investment budget, funds for regeneration/ compensatory afforestation.
  - It envisages the use of Wastelands and degraded lands have been suggested to be utilized for afforestation and other plantation purposes. **Hence statement 2 is correct.**

Q 6.D

- **Homeostasis:**
  - The process through which an organism tries to maintain the consistency of its internal environment despite varying external environmental conditions is called Homeostasis.

- **Eurythermal:**
  - **Organisms which can tolerate and thrive in a wide range of temperatures are called Eurythermal**. **Hence statement 1 is not correct.**
- **'Stenothermal:**
  - **Organisms which restrict themselves to a narrow range of temperature are called 'Stenothermal'**. **Hence statement 2 is not correct.**

Q 7.A

- **Water pollution:** The most serious water pollutants are the disease causing agents called pathogens. Pathogens include bacteria and other organisms that enter the water from domestic sewage and animal excreta. Human excreta contain bacteria such as Escherichia coli and Streptococcus faecalis which cause gastrointestinal diseases.
- **Nitrate: The maximum limit of nitrate in drinking water is 50 ppm. Excess nitrate in drinking water can cause diseases such as methemoglobinemia ('blue baby' syndrome)**. It is a condition where a baby's skin turns blue or bluish-purple due to low levels of oxygen in the blood. **Hence, option (a) is the correct answer.**

Q 8.D

- **Radioactive materials such as uranium and radium possess highly unstable atomic nuclei** whose disintegration results in radiation emission which may be highly injurious. **During nuclear tests, radioactive dust may encircle the globe at altitudes of 3000 meters or more.** This dust often comes down to earth as rain. Some of it percolates down through the soil into ground, water reservoirs or is carries into rivers and streams**. Hence statement 2 is correct.**
- **Radioactive wastes are generated from X-ray machines in hospitals and airports, nuclear energy industry** which include substances used in cooling and storing nuclear fuel from reactors in power stations and submarines. **Hence statement 3 is correct.**
- **The waste can remain radioactive for a few hours or several months or even hundreds of thousands of years. Depending on the level and nature of radioactivity, r**adioactive wastes can be classified as exempt waste, Low & Intermediate level waste and High-Level Waste. **Hence, statement 1 is not correct.**

Q 9.C

- Genetic diversity refers to the diversity (or genetic variability) within a single species. Each individual species possesses genes that are the source of its own unique features: In human beings, for example, the huge variety of people's faces reflects each person's genetic individuality. The term genetic diversity also covers distinct populations of a single species, such as the thousands of breeds of different dogs or the numerous variety of roses. **Hence, statement 1 is correct.**
- Human beings genetically belong to the homo sapiens group and also differ in their characteristics such as height, colour, physical appearance, etc., considerably. This is due to genetic diversity.
- The huge variety of different gene sets define an individual or a whole population's ability to tolerate stress from any given environmental factor. Genetic Diversity is also important with respect to the adaptability of species to varied environments with special reference to changing climatic conditions. **So higher is the Genetic diversity greater are the chances of adapting to Environmental changes and thus more confirmed is the survival of the species. Hence, statement 2 is correct.**

Q 10.A

- **Homeostasis is the maintenance of stable equilibrium, especially through bodily part functions. For example- Cooling your body through sweating processes. Despite the varying external environmental conditions, organisms try to maintain the constancy of their internal environment that tends to upset their homeostasis. Hence option (a) is the correct answer.**
- **Regulate** some organisms can maintain homeostasis by physiological or sometimes behavioral means which ensures constant body temperature, constant osmotic concentration, etc. for example standing under a shading tree. Mammals and birds are capable of such regulation also known as thermoregulation and osmoregulation. This is the reason for the 'success' of mammals to maintain constant body temperature and thrive whether they live in Antarctica or the Sahara Desert. However, Plants do not have a mechanism of Homeostasis.

- **Aquatic animals change the osmotic concentration of the body fluids with that of the ambient water osmotic concentration.** The organism also migrates temporarily from one habitat which can be stressful to a more hospitable area and return when a stressful period is over for example- In Keoladeo National Park (Bharatpur) in Rajasthan thousands of migratory birds coming from Siberia during the winter season and other extremely cold northern regions. In bacteria, fungi and lower plants have thick-walled spores that help them to survive unfavorable conditions.

Q 11.D

- Biomedical waste comprises human & animal anatomical waste, treatment apparatus like needles, syringes, and other materials used in health care facilities in the process of treatment and research.

Its salient features are:

- The ambit of the rules has been expanded to include vaccination camps, blood donation camps, surgical camps, or any other healthcare activity. **Hence statement 1 is not correct.**
- Pre-treatment of the laboratory waste, microbiological waste, blood samples and blood bags through disinfection or sterilisation on-site in the manner as prescribed by WHO or NACO.
- Bio-medical waste has been classified into 4 categories (with different set of colour codes) to improve the segregation of waste at source. **Hence statement 2 is not correct.**
  - Red Bin for plastic waste such as bottles, syringes, etc.
  - Yellow Bin for infectious wastes such as cotton, bandage, placenta, etc.
  - Blue Bin for glass bottles like discarded medicines
  - Black Bin for needles without syringes, metal articles, etc.
- The new rules prescribe more stringent standards for incinerators to reduce the emission of pollutants in the environment, and include emissions limits for dioxins and furans.

Q 12.C

- **Context: Recently, the TCS Chairman highlighted the future prospects of rise of 'dark factories' in IT and business services.**
- **Dark Factories**
  - Also known as lights-out factories, fully automated facilities where robots, AI-driven systems, and IoT (Internet of Things) devices handle all production processes. They are designed to operate 24/7 without human intervention. E.g. Fanuc (Japan), Siemens (Germany).
- **Advantages**
  - Dark Factory is now a reality, and it is on its way to becoming the new norm for mass production. The expansion of lights-out production can be attributed to several factors, including:
    - Lower Production Costs – The primary benefit of dark manufacturing is low costs. Employee salaries are eliminated due to the lack of a workforce, as articulated robots can work in dark and non-climate-controlled situations, thereby conserving the utilities.
    - Refines Environmental Footprint – Lights-out manufacturing is a sustainable manufacturing strategy that reduces the impact on the environment. Industrial robots that are newer are more energy efficient. Also, the excellent precision of robots reduces material waste and scrap, and since robots are carbon-free, they help reduce pollution levels.
    - Enhanced Productivity and Product Quality: Since a single robot can complete tasks that would typically need multiple employees, robots help boost plant productivity substantially. Besides, accuracy and precision lead to better product quality. As robots are designed to obey application-specific instructions, uniformity in workpieces results in minimal inconsistencies.
    - Eliminates Labour Shortages: Manufacturers have faced labour shortages in recent years, particularly for skilled labour roles. The pool of employees interested in manual labour has shrunk, making it challenging to fill vacancies. This problem is solved by using automated equipment to fill robotic positioners instead of employees in dark factories.
- **Hence, option (c) is the correct answer**

Q 13.D

- **The greenhouse effect** is a natural process that warms the Earth's surface. When the Sun's energy reaches the Earth's atmosphere, some of it is reflected back to space and the rest is absorbed and re-radiated by greenhouse gases. Earth is surrounded by a blanket of air called the atmosphere. Greenhouse gas molecules in the atmosphere trap heat as they are transparent to sunlight but not to heat radiation. If

the amount of carbon dioxide crosses the delicate proportion of 0.03 percent, the natural greenhouse balance may get disturbed. **Carbon dioxide** is a major contributor to global warming.

- Besides **carbon dioxide, other greenhouse gases are methane, water vapor, nitrous oxide, and ozone. Methane** is produced naturally when vegetation is burnt, digested, or rotted in the absence of oxygen. Large amounts of methane are released in paddy fields, coal mines, rotting garbage dumps, and by fossil fuels. **Chlorofluorocarbons (CFCs)** are man-made industrial chemicals used in air conditioning etc. CFCs are also damaging the ozone layer. **Nitrous oxide** occurs naturally in the environment. In recent years, their quantities have increased significantly due to the use of chemical fertilizers and the burning of fossil fuels.
- **Hence option (d) is the correct answer.**

Q 14.B

- **Context: Massive weather phenomena called twisters were observed in the US.**
- **Twister**
  - It is another name for tornadoes in the US which are violently spinning (at 250 Miles/Hr), funnel-shaped columns of air that stretch from the dark thunderclouds they form all the way to the ground.
  - **Formation:** They develop when moist and warm air collides with dry and cold air, creating atmospheric instability and strong updrafts within a thunderstorm. The resulting wind shear causes the air to spin, and if this rotation is tilted vertically and intensifies, a tornado (or twister) form. The majority of these are formed around Gulf of Mexico as it acts as large source of moisture.
- **Hence, option (b) is the correct answer**

Q 15.B

- **Context: Recently, the Zangezur Corridor was in the news as it can potentially challenge India's strategic interests in West and Central Asia.**
  - **The Zangezur Corridor is a planned transport route that connects Azerbaijan to its Nakhchivan region by passing through the southern part of Armenia.**
  - It will link Azerbaijan's capital Baku to Kars in Türkiye, going through Armenia near the Iranian border.
  - The corridor includes railways and highways that were originally built during the Soviet Union period but were later destroyed due to war.
  - This corridor will help Azerbaijan reach its Nakhchivan region without needing to go through Iran or checkpoints controlled by Armenia.
  - It will allow smooth movement of goods, people, and vehicles between Azerbaijan, Nakhchivan, and Türkiye.
  - It is also part of a larger project that connects Europe to Central Asia and China through road and railway networks.
- **Hence, option (b) is the correct answer**

Q 16.C

- **Context: NATO Parliamentary Assembly arrived in Dayton (Ohio, USA), where the Dayton Peace Agreement was reached at.**
- **Dayton Peace Agreement (DPA).**
  - **The North Atlantic Treaty Organization, also called the North Atlantic Alliance, is an intergovernmental transnational military alliance of 32 member states—30 European and 2 North American.**
  - The Dayton Peace Agreement (also known as the Dayton Accords) was a peace agreement reached at the Wright-Patterson Air Force Base near Dayton, Ohio, USA, in November 1995, and formally signed in Paris on December 14, 1995. It officially ended the Bosnian War (1992–1995), which was part of the breakup of Yugoslavia.
  - Significance: Also known as the General Framework Agreement for Peace in Bosnia and Herzegovina, it had put an end to the three-and-a-half-year-long Bosnian War, in the former Socialist Federative Republic of Yugoslavia. The current Constitution of Bosnia and Herzegovina is the Annex 4 of the DPA.
  - **Hence, option (c) is the correct answer**

Q 17.A

- Foundation species are organisms that **play a crucial role in shaping and maintaining ecosystems that support other species.** They have a disproportionate impact on their environment, often by creating or modifying habitats that support a wide range of other species. **For example, Corals supporting other species in the ecosystem.**
  - Foundation species are typically dominant or abundant in their ecosystems and can significantly influence ecosystem structure, function, and biodiversity.
  - These species form the backbone of ecosystems, providing essential resources and habitat for other organisms.
- **A beaver building a dam that creates a pond is an example of a foundation species because**
  - **Habitat Creation:** Beavers are ecosystem engineers, meaning they significantly alter their environment. By constructing dams across streams or rivers, they create ponds or wetlands. These newly created habitats are often rich in resources and provide homes for a diverse array of organisms.
  - **Biodiversity Support:** The pond created by the beaver dam becomes a focal point for biodiversity. It supports a variety of plants, animals, and microorganisms that may not thrive in the original stream or river habitat. Fish, amphibians, birds, insects, and aquatic plants are just some examples of the species that can benefit from the new habitat.
  - **Resource Availability:** The pond created by the beaver dam provides resources such as water, food, shelter, and breeding sites for a wide range of organisms. For instance, fish find refuge in the deeper waters, amphibians lay their eggs in shallow areas, and birds nest in the surrounding vegetation.
  - **Ecosystem Stability**: The presence of the beaver and the pond it creates can enhance ecosystem stability. Ponds act as buffers against floods and droughts, help regulate water flow, and filter pollutants from the water. Additionally, the complex interactions between species within the pond ecosystem contribute to its resilience to environmental changes.
  - **Dominant Influence**: Foundation species like beavers have a disproportionate impact on their ecosystems compared to their abundance. While beavers themselves are relatively small in number, their engineering activities fundamentally transform landscapes and influence the distribution and abundance of numerous other species. This makes them essential for the structure and function of the ecosystem.
- **A top predator regulating the population of prey species**: While top predators play important roles in ecosystems by controlling prey populations and maintaining balance, they typically do not create or modify habitats in the same way that foundation species do. Instead, top predators are more often **considered keystone species**, which have a disproportionately large impact on their ecosystems due to their ecological roles.
- **An invasive species outcompeting native vegetation**: Invasive species can have significant impacts on ecosystems by outcompeting native species, disrupting ecological processes, and altering habitats. However, they are not considered foundation species because their presence tends to reduce biodiversity and disrupt ecosystem functions rather than enhancing them.
- **A decomposer breaking down organic matter in soil**: Decomposers, such as bacteria, fungi, and detritivores, play crucial roles in nutrient cycling by breaking down organic matter. While they are essential for ecosystem function, decomposers do not typically create or modify habitats to the extent that foundation species do. They primarily operate within existing habitats, rather than actively shaping them.
- **Hence option (a) is the correct answer.**

Q 18.C

- **"Biodiversity Heritage Sites" (BHS)** are well-defined areas that are unique, ecologically fragile ecosystems - terrestrial, coastal, and inland waters and, marine having rich biodiversity comprising of any one or more of the following components:
  - **richness of wild as well as domesticated species or intra-specific categories;** high endemism; presence of rare and threatened species, keystone species, species of evolutionary significance, wild ancestors of domestic/cultivated species or their varieties, and past pre-eminence of biological components represented by fossil beds and having significant cultural, ethical, or aesthetic values and are important for the maintenance of cultural diversity, with or without a long history of human association with them. **Hence option (b) is not correct.**
- **Under Biological Diversity Act, 2002 (BDA) the State Government in consultation with local bodies may notify in the official gazette, of areas of biodiversity importance as Biodiversity Heritage Sites (BHS). Hence option (a) is not correct.**

- **State Government in consultation with the Central Government may frame rules for the management and conservation of BHS. Hence option (d) is not correct.**
- State Governments shall frame schemes for compensating or rehabilitating any person or section of people economically affected by such notification.
- The criteria for identification of BHS-
  - Accordingly, areas having any of the following characteristics may qualify for inclusion as BHS.
  - Areas that contain a mosaic of natural, semi-natural, and man-made habitats, which together contain a significant diversity of life forms.
  - **Areas that contain significant domesticated biodiversity components and/or representative agro-ecosystems with ongoing agricultural practices that sustain this diversity. Hence option (c) is the correct answer.**
  - Areas that are significant from a biodiversity point of view also are important cultural spaces such as sacred groves/trees and sites, or other large community-conserved areas.
  - Areas including very small ones that offer refuge or corridors for threatened and endemic fauna and flora, such as community conserved areas or urban greens and wetlands.
  - All kinds of legal land uses whether government, community, or private land could be considered under the above categories.
  - As far as possible those sites may be considered which are not covered under the Protected Area network under the Wildlife Protection Act 1972 as amended.
  - Areas that provide habitats, aquatic or terrestrial, for seasonal migrant species for feeding and breeding.
  - Areas that are maintained as preservation plots by the research wing of the Forest department.
  - Medicinal Plant Conservation Areas.

Q 19.D

- Levels of Organization in Ecology
- **Organism:** An organism is a fundamental functional unit in ecology because it interacts directly with the environment as well as with other organisms, e.g., a rabbit.
- **Population:** It refers to the organisms of the same species that are in proximity to one another, e.g., a group of rabbits. **Hence, statement 1 is correct.**
- **Community:** It includes all the populations occupying a given area. The size of a community depends on our scale of reference. The community and the non-living environment together are referred to as an ecological system or ecosystem, e.g., a pond with fish and plants. **Hence, statement 2 is correct.**
- **Biome:** It refers to a large regional or subcontinental ecosystem characterized by similarity in vegetation and climate. It is made of many similar ecosystems. An ecosystem is much smaller than a biome. For example, a grassland biome implies many ecosystems that are similar because grasses are, their principal plants and grazers are their predominant animals. **Hence, statement 3 is correct.**

Q 20.C

- **Context: Karnataka Issues Platform-Based Gig Workers (Social Security and Welfare) Ordinance 2025.**
- **A gig worker is defined in Code on Social Security, 2020 as a person who works in an arrangement outside of a traditional employer-employee relationship. Gig workers are individuals engaged in temporary, flexible, and short-duration work,** typically outside the traditional employer–employee structure, and often enabled by digital or app-based platforms (e.g., delivery services, ride-hailing, freelancing). **Hence, statement 1 is correct, but statement 3 is not correct.**
- Gig workers in India are categorized into two broad groups:
  - Platform-based workers, who connect with clients via digital platforms or apps (e.g., Uber, Zomato).
  - Non platform gig workers, who perform temporary or piece-rate jobs outside any online platform, such as manual labourers, home-based workers, and contract labor **Hence, statement 2 is correct.**
- As per NITI Aayog the number of gig workers and platform workers in India was 7.7 million in 2020-21, which is expected to rise to 23.5 million by 2029-30.

Q 21.C

- "Biodiversity Heritage Sites" (BHS) are declared under the Biological Diversity Act 2002 and are well-defined areas that are unique, ecologically fragile ecosystems - terrestrial, coastal, and inland waters and marine areas with rich biodiversity.
- **It comprises one or more of the following components:**
- Richness of wild as well as domesticated species or intra-specific categories. **Hence statement 1 is correct.**

- High endemism, presence of rare and threatened species, keystone species, species of evolutionary significance, wild ancestors of domestic/cultivated species or their varieties,
- Past preeminence of biological components represented by fossil beds that have significant cultural, ethical, or aesthetic values and are important for the maintenance of cultural diversity, with or without a long history of human association with them.
- Under the Biological Diversity Act, 2002 (BDA), the State Government, in consultation with local bodies, may notify in the official gazette areas of biodiversity importance as Biodiversity Heritage Sites (BHS).
- The State Government in consultation with the Central Government, may frame rules for the management and conservation of BHS.
- State Governments shall frame schemes for compensating or rehabilitating any person or section of people economically affected by such notification
- **Accordingly, areas having any of the following characteristics may qualify for inclusion as BHS.**
  - Areas that contain a mosaic of natural, semi-natural, and man-made habitats, which together contain a significant diversity of life forms.
  - Areas that contain significant domesticated biodiversity components and/or representative agro-ecosystems with ongoing agricultural practices that sustain this diversity. **Hence statement 2 is correct.**
  - Areas that are significant from a biodiversity point of view are also important cultural spaces, such as sacred groves/trees and sites, or other large community-conserved areas.
  - Areas, including very small ones, that offer refuge or corridors for threatened and endemic fauna and flora, such as community conserved areas or urban greens and wetlands.
  - All kinds of legal land uses, whether government, community, or private land, could be considered under the above categories.
  - As far as possible, those sites may be considered which are not covered under the Protected Area network under the Wildlife Protection Act 1972 as amended.
  - Areas that provide habitats, aquatic or terrestrial, for seasonal migrant species for feeding and breeding.

Q 22.B

- **Context: The USA President aborted the move to rename the Persian Gulf as the 'Arabian Gulf' or 'Gulf of Arabia'.**
- **Persian Gulf**
  - It is a shallow marginal sea of the Indian Ocean that lies between the Arabian Peninsula and southwestern Iran.
  - The Strait of Hormuz links the Persian Gulf (west) with the Gulf of Oman and the Arabian Sea (southeast).
  - **It is bordered by Iran, Oman, UAE, Qatar, Bahrain, Saudi Arabia, Kuwait and Iraq.**
  - The small freshwater inflow into the gulf is mostly from the Tigris, Euphrates, and Karun rivers.
  - It is an important waterway for marine transport, particularly for oil.

- **Hence, option (b) is the correct answer**

Q 23.D

- Ecologists and evolutionary biologists have proposed various hypotheses to account for the greater biological diversity in the Tropics.
  - Speciation is generally a function of time, **unlike temperate regions subjected to frequent glaciations in the past, tropical latitudes have remained relatively undisturbed for millions of years** and thus, had a long evolutionary time for species diversification.
  - **Tropical environments**, unlike temperate ones, are less seasonal, relatively more constant and predictable. Such constant environments **promote niche specialisation and lead to a greater species diversity.**
  - There is **more solar energy available in the tropics, which contributes to higher productivity**; this in turn might contribute indirectly to greater diversity.
  - **Hence, option (d) is the correct answer**

Q 24.C

- Predation and parasitism are two types of negative biotic interactions between the organisms living in the Earth.
- Parasitism is an interaction between a parasite and a host in which the former obtains benefits at the cost of later. A parasite does not cause the death of the host. Whereas Predation is an association between two species, where one species (predator) kills to feed on the prey. **Hence, statement 1 is correct.**
- In Parasitism the weak feed on the strong while in predation it is strong that feeds on the weak. **Hence, statement 2 is correct.**
  - For example, Glochidium larva attaches to the fins of a fish is an example of parasitism and Birds feeding on fish is an example of predation.

Q 25.C

- Measuring the diversity of a species generally incorporates estimates of "richness". Also referred to as **alpha-diversity, species richness is a common way of measuring biodiversity and involves counting the number of individuals - or even families - in a given area.**
- At the ecosystem-level, measures of biodiversity are often used to compare two ecosystems or to determine changes over time in a given region. Describing changes in biodiversity within or between ecosystems is called beta-diversity. Measures of **beta-diversity indicate the difference in species richness between two different habitats or within a single community at different points in time.** The resulting number indicates to researchers whether there is any overlap in the species found in each group.
- **Gamma-diversity**, on the other hand, estimates the **total biodiversity within an entire region.**
- **Hence, option (c) is the correct answer.**

Q 26.B

- **Simlipal National Park is located in the Mayurbhanj district of Orissa state of India**. This National Park comprises dense Sal forest due to which this park has been chosen for the Project Tiger. The fauna of this national park includes tigers, elephants, deer, pea foul, talking mainas, chital, sambhar, panther, gaur, hyenas, and sloth beer. Notified in the year 1978, this national park is spread over an area of 135,500 hectares.
- **Hence, option (b) is the correct answer.**

Q 27.B

- **Gause's Hypothesis/ Exclusion Principle:** It states that if two species have almost completely overlapping niches they cannot continue to coexist. One of the two species will outcompete the other and persist. The other will go locally extinct.
- **Hence, option (b) is the correct answer.**

Q 28.C

- **Context: A Karnataka MLA was disqualified after being convicted by a CBI court in an illegal mining case, leading to a vacancy in the constituency.**
- The disqualification was made under Article 191 of the Constitution and Section 8 of the Representation of the People Act (RPA) 1951.

- Disqualification of a Sitting Lawmaker Constitutional Provisions: Articles 102 and 191 of the Constitution spell out the following conditions, owing to which a Member of Parliament (MP) or an MLA (respectively) can be disqualified
  - **Holding Office of Profit. Hence, option 1 is correct.**
  - **Person of unsound mind (stands so declared by a competent court). Hence, option 3 is correct.**
  - **An undischarged insolvent. Hence, option 5 is correct.**
  - Not a citizen of India or has voluntarily acquired the citizenship of a foreign State
  - Defection
- Disqualified by or under any law made by Parliament Statutory Provision: Under the RPA, 1951, a lawmaker is disqualified for
  - **Conviction for two years or more in crimes like bribery, rape, promoting enmity, or untouchability (Section 8). Hence, option 4 is not correct.**
  - **Involvement in corrupt practices. Hence, option 2 is not correct.**
  - Dismissal from government for corruption/disloyalty
  - Having a contract with the government
  - Holding a key position in a company with 25% or more government ownership
  - Failure to report election expenses

Q 29.C

- **Context: Recently, the Competition Commission of India has notified the Cost Regulations, 2025, providing new definitions to curb predatory pricing.**
- **Predatory Pricing:**
  - Predatory pricing is a strategy where a dominant company intentionally sells goods or services below cost to drive out competitors, potentially leading to a monopoly. This tactic involves setting prices so low that smaller rivals, unable to sustain such losses, are forced to exit the market. Once competition is diminished, the predatory company can then raise prices, potentially above pre-predation levels, harming consumers in the long run.
  - Section 4(2) of the Competition Act, 2002 identifies predatory pricing by a dominant enterprise as an abusive practice.
- **Impact of predatory pricing:**
  - On customers: Beneficial in the short term with lower prices, but they suffer in the long term due to fewer options and higher prices.
  - On Companies: Harms all companies in the short term, but once competitors are driven out, the monopolised companies raise prices and recover lost profits.
- **Hence, option (c) is the correct answer**

Q 30.C

- **Context: With the successful integration of the Bharat Forecast System (BFS) into the IMD, India has become the only country operating a global forecast system at such a high resolution in real time.**
- The Bharat Forecast System (BFS) is India's first indigenously developed high-resolution global weather forecasting model, designed and built by IITM, Pune. It represents a major step toward self-reliant meteorological capabilities under India's "Atmanirbhar Bharat" initiative. **Hence, statement 1 is correct.**
- It can provide 6 km resolution forecasts for the tropical region that falls between 30 degrees South and 30 degrees North Latitudes. Global forecast models run by the European, British and the US have a resolution between 9 km & 14 km. **This makes BFS the highest-resolution global forecast system currently operational, surpassing platforms like the U.S., European, and U.K. systems. Hence, statement 2 is correct.**

Q 31.B

- **Context: The Kumbakonam vetrilai or betel leaf or paan leaf was recently granted a Geographical Indication (GI) tag by the Government of India, recognising its regional uniqueness and cultural significance.**
  - Kumbakonam Vetrilai is cultivated in Thanjavur district of Tamil Nadu, particularly around the Cauvery basin near Kumbakonam, not in Karnataka. It is recognized for its heart-shaped leaves, unique flavor, and aroma due to the fertile alluvial soils of that region. **Hence, statement 1 is not correct.**

- The dark to light green, oblong heart-shaped leaves with a pungent taste. Betel leaves aid digestion and are rich in antioxidants. High in chavicol, an anti-inflammatory compound that fights oxidative stress, common in conditions like diabetes.
- The Kumbakonam Vetrilai, or Kumbakonam betel leaf, received the GI tag in April 2025, officially recognizing its unique qualities—including its aroma and flavour—and linking them to its geographic origin. **Hence, statement 2 is correct.**

Q 32.D

- Invasive Species: Plants, animals, fungi, or microorganisms that spread rapidly and cause harm to other species are called Invasive Species. Invasive species are sometimes so harmful and damaging that they threaten an entire ecosystem. An "invasive species" is defined as a species that is -
  - Non-native (or alien) to an ecosystem, and
  - Whose introduction causes or is likely to cause economic or environmental harm or harm to human health.
- The Nile perch introduced into Lake Victoria in east Africa led eventually to the extinction of an ecologically unique assemblage of more than 200 species of cichlid fish in the lake. You must be familiar with the environmental damage caused and the threat posed to our native species by invasive weed species like **carrot grass (Parthenium), Lantana, and water hyacinth (Eichhornia)**.
- The recent illegal introduction of the African catfish Clarias gariepinus for aquaculture purposes is posing a threat to the indigenous catfishes in our rivers. **Euglandina rosea (Rosy wolf snail) and Tasmanian Brush-tail Possum (Trichosurus vulpecula) are two other examples of invasive species.**
- **Hence, option (d) is the correct answer.**

Q 33.C

- **Bioremediation: It is a treatment that uses naturally occurring organisms to break down hazardous substances into less toxic or non-toxic substances.** It uses microorganisms to degrade organic contaminants in soil, groundwater, sludge, and solids. The microorganisms break down contaminants by using them as an energy source or co-metabolizing them with an energy source. When Fungi are used, it is called mycoremediation. Bioremediation may be conducted in situ or ex situ. **Hence statement 1 is correct.**
- **Genetic engineering has been used to create organisms designed for specific purposes. For e.g. bacterium Deinococcus radiodurans (the most radioresistant organism known) has been modified to consume and digest toluene and ionic mercury from highly radioactive nuclear waste. Hence statement 2 is correct.**

Q 34.A

- **Context: Minister of Defence Urged International Atomic Energy Agency (IAEA) Oversight of Pakistan's Nuclear Arsenal.**
  - **The International Atomic Energy Agency (IAEA) was established in 1957 as an autonomous international organisation**. It works in close cooperation with the United Nations, and it reports to both the UN General Assembly and the UN Security Council. Although not formally part of the UN system, it operates under its own statute and is considered the world's central intergovernmental forum for scientific and technical cooperation in the nuclear field. All member states meet annually in Vienna. **Hence, statement 1 is correct.**
  - **The IAEA itself is not a member of the Non-Proliferation of Nuclear Weapons Treaty (NPT) because only sovereign states can be parties to the NPT.** However, the IAEA plays a vital role in the implementation of the treaty. Member states of the NPT agree to conclude safeguards agreements with the IAEA, which enable the agency to inspect their nuclear facilities to verify compliance. **Hence, statement 2 is not correct.**
  - **The IAEA plays a key verification responsibilities under the Treaty.** Each non-nuclear-weapon State party is required under NPT to conclude a comprehensive safeguards agreement (CSA) with the IAEA to enable the IAEA to verify the fulfilment of their obligation. **Hence, statement 3 is correct.**

Q 35.C

- **Context: A protest erupted in Goa after a report by CSIR–National Institute of Oceanography, Goa, claimed that Karnataka's diversion of Mahadayi river water would have "less impact" on Goa.**
  - **The Mahadayi River flows through only two states — Karnataka and Goa — before draining into the Arabian Sea**. The Mahadayi River, also known as the Mandovi River in Goa, originates in the Bhimgad Wildlife Sanctuary in the **Western Ghats in Karnataka's Belagavi district. This makes Karnataka the upper riparian state**. The river has been the subject of inter-state disputes over water sharing between Karnataka and Goa. **Hence, statement 1 is correct.**
  - **The Mahadayi River is considered a perennial river, as it flows throughout the year, though its volume varies seasonally.** It is indeed fed by monsoon rains, but it does not dry up completely in the dry season. This perennial nature is a crucial point in the water-sharing dispute, especially for Goa, which argues that any diversion would affect the river's ecological and water security balance. **Hence, statement 2 is correct.**

Q 36.C

- The purpose of the Indian Forest Act, 1927, was the protection and conservation of forests and the judicial use of forest products. It aimed to regulate the movement of forest produce and the duty leviable forest produce. **Hence statement 1 is correct.**
- Reserved forest was first notified under Section 20 (declaration of reserved forest) of the Indian Forest Act, 1927. It also explains the procedure to be followed for declaring an area as a Reserved Forest, a Protected Forest, or a Village Forest. **Hence statement 2 is correct.**
- Reserved Forests: Reserve forests are the most restricted forests and are constituted by the State Government on any forest land or wasteland which is the property of the Government. In reserved forests, local people are prohibited, unless specifically allowed by a Forest Officer in the course of the settlement.
- Village forests are those in which the State Government may assign to any village community the rights of the Government to or over any land which has been constituted a reserved forest. **Hence statement 3 is not correct.**

Q 37.C

- On the international level, the IUCN and the WWF established Trade Records Analysis of Flora and Fauna in International Commerce (TRAFFIC) in 1976. **Hence, statement 1 is correct.**
- The secretariat of the TRAFFIC has strengthened the efforts of the International Community to monitor and control illegal trade in wildlife and in their body parts. TRAFFIC is concerned with the monitoring of both the legal as well as the illegal trade in Wildlife across the world. **Hence, statement 2 is correct.**

Q 38.A

- The Insolvency and Bankruptcy Code (IBC), 2016 was enacted to unify and streamline the insolvency framework across corporate entities, partnership firms, and individuals. It consolidates multiple earlier laws into a single, coherent regime, thereby ending the fragmentation that previously existed under different statutes. **Hence, statement 1 is correct.**
- Under Section 61 of the IBC, all appeals against National Company Law Appellate Tribunal (NCLT) orders relating to insolvency and bankruptcy of companies and limited liability partnerships (LLPs) are heard by the NCLAT. Decisions by NCLAT can only be further appealed to the Supreme Court. **Hence, statement 2 is not correct.**
- The IBC explicitly sets a maximum time limit under Section 12 for completing the Corporate Insolvency Resolution Process (CIRP). Initially set at 180 days, extendable by 90 days, a 2019 amendment capped the process at 330 days in total, including any legal delays and extensions. **Hence, statement 3 is not correct.**

Q 39.C

- **Ex-situ conservation means conservation of wildlife outside its natural habitat.** The conservation takes place in captivity under man's supervision. Some times the populations of species may decline or may become extinct due to genetic or environmental factors such as inbreeding, habitat loss, disease and over- exploitation. In such cases in-situ conservation may not prove to be effective and a species can be protected from becoming extinct only through maintaining them in artificial conditions under human care. Such, measures are included under Ex-Situ Conservation Methods.

- **Examples are: Botanical gardens, zoo, aquariums, parks, agricultural research centre, forest research centres, etc.**
- **A Biosphere Reserve is a unique and representative ecosystem of terrestrial and coastal areas which are** internationally recognised within the framework of UNESCO's Man and Biosphere (MAB) Programme. The Biosphere Reserve aims at achieving the three objectives - conservation, development and research. **Biosphere Reserve is an example of In-Situ Conservation method.**
- **Hence, option (c) is the correct answer.**

Q 40.A

- **The 1999 Gothenburg Protocol aims to improve air quality across borders. It is a protocol to the Convention on Long-Range Transboundary Air Pollution of the United Nations Economic Commission for Europe (UNECE) and specifically addresses the abatement of acidification, eutrophication and ground-level ozone**. The protocol defined emission ceilings, technical standards for reducing air pollutant emissions, and emission limit values for technical facilities. **Hence, option (a) is the correct answer.**
- Amendments to the Gothenburg Protocol updated targets to further **reduce emissions of harmful air pollutants and added measures to address particulate matter, including black carbon.** The amended Gothenburg Protocol is the first international agreement addressing black carbon.
- The amended Gothenburg Protocol, in force since 2019, is the only binding regional treaty anywhere in the world to regulate major air pollutant emissions. It already supports 28 Parties – including the European Union, the UK, the US and Canada – to deliver significant emissions cuts.
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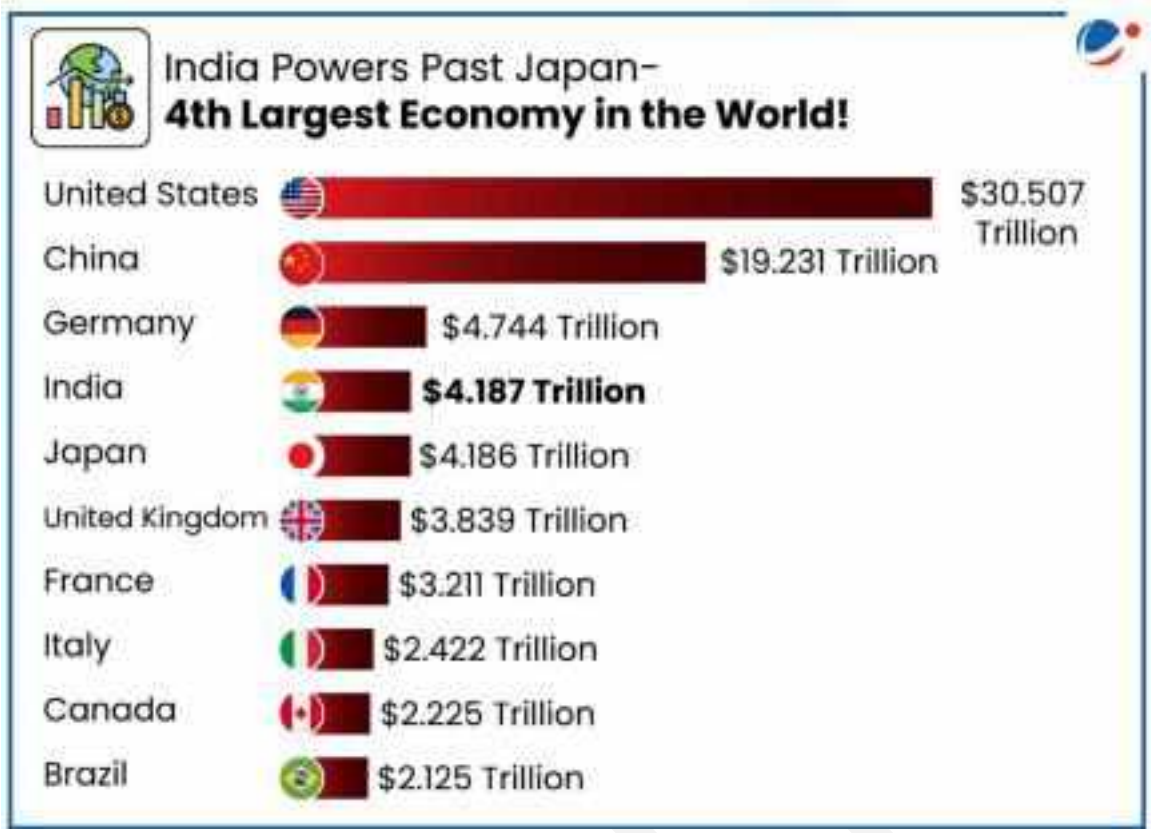
Q 41.D

- **The Rio Declaration on Environment and Development, adopted at the 1992 Earth Summit in Rio de Janeiro,** outlines 27 principles to guide countries towards sustainable development. **The National Adaptation Fund on Climate Change (NAFCC) was launched in 2015** with an initial outlay of Rs. 350 crores to meet the cost of adaptation to climate change for the States and Union Territories of India that are particularly vulnerable to the adverse effects of climate change. **Hence statement 1 is not correct.**
- The overall aim of the fund is to support concrete adaptation activities which are not covered under ongoing activities through the schemes of the State and National Governments that reduce the adverse effects of climate change facing communities, sectors, and states. The Scheme has been taken as a Central Sector Scheme with the National Bank for Agriculture and Rural Development (NABARD) as the National Implementing Entity (NIE). **Hence statement 2 is not correct.**

Q 42.C

- **Context: As per the recent World Economic Outlook of the IMF, India has surpassed Japan to become 4th largest economy worldwide.**
- **India has surpassed Japan to become the world's fourth-largest economy.** The IMF in its recent report has said that India will remain the world's fastest-growing major economy. India continues to remain the world's fastest-growing major economy and the only country expected to clock over 6 per cent growth in the next two years.
- According to the IMF, India's GDP currently stands at 4.3 trillion dollar. India's GDP was 2.1 trillion dollar in 2015, since then, the country has more than doubled its economy. According to the report, the high rate of growth will see India's GDP increasing to 5.5 trillion dollar in 2028 overtaking Germany to become the third-largest economy.
- The IMF has projected a zero growth rate for Germany in 2025, followed by 0.9 per cent in 2026 as it is expected to be hit the hardest among the European countries due to the ongoing global trade war.
- The GDP of the US, the world's largest economy, has been pegged at 30.5 trillion dollar for 2025, while that of China, the second biggest, is around 19.2 trillion dollars.



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

Q 43.A

- **Context: The fibre optics First-Person-View (FPV) drones are being used in the Russia-Ukraine war.**
  - Fibre optic drones—also referred to as fiber optic tethered drones—remain physically connected to their ground base via a lightweight fiber optic cable that unspools as they fly. The tether provides both data communication and often power supply, ensuring a stable connection throughout the flight. **Hence, statement 1 is correct.**
  - Because all control signals and video data are transmitted through the fiber optic link, these drones emit no radio-frequency signals. This makes them immune to jamming, spoofing, or interception, providing a clear advantage in electronic warfare environments. **Hence, statement 2 is correct.**
  - While fiber optic drones are gaining traction, especially in conflict zones like Ukraine and by militaries exploring electronic warfare resistant platforms, they are not yet widely used in mainstream long-range surveillance. Their operational range is limited by tether length, and deployment remains specialized and mission-specific rather than routine. **Hence, statement 3 is not correct.**

Q 44.D

- India has been blessed with a rich history and natural diversity, which is exemplified by its 42 UNESCO World Heritage Sites. These include 34 Cultural sites, 7 Natural sites, and 1 mixed site recognized for their outstanding universal value to humanity. A World Heritage site is a landmark or area with legal protection by an international convention administered by the United Nations Educational, Scientific and Cultural Organisation (UNESCO).
- **India has 7 UNESCO World Heritage natural sites:**
- **Kaziranga National Park (1985)-** It is located in Assam. It is home to the world's largest population of one-horned rhinoceros.
- **Manas Wildlife Sanctuary (1985)-** It is located in Assam. It is a critical tiger habitat representing the biodiversity of the Eastern Himalayas.
- **Keoladeo National Park (1985)-** It is located in Rajasthan. It is an important man-made wetland providing refuge to migratory waterbirds.
- **Sundarbans National Park (1987)-** It is located in West Bengal. It is the largest estuarine mangroveforest globally endangered by rising sea levels.

- **Nanda Devi and Valley of Flowers National Parks (1988, 2005)**- It is located in Uttarakhand. It has contrasting alpine wildflower meadow and rugged glacial wilderness protecting diverse flora and fauna.
- **Western Ghats (2012)**- It covers areas of Karnataka, Kerala, Tamil Nadu, and Maharashtra. The mountain range of the Western Ghats running parallel to the western coast is recognized for high endemism and biodiversity.
- **Great Himalayan National Park (2014)**- It is located in Himachal Pradesh. Diverse ecosystems and biodiversity of the Great Himalayas include glaciers, alpine meadows, and forest wildlife.
- **Hence, option (d) is the correct answer.**

Q 45.B

- The ecological pyramids are of three categories.
  - Pyramid of numbers,
  - Pyramid of biomass, and
  - Pyramid of energy or productivity
- **Pyramid of Numbers:**
  - This deals with the relationship between the numbers of primary producers and consumers of different levels. It is a graphic representation of the total number of individuals of different species, belonging to each trophic level in an ecosystem.
  - In a forest or lake ecosystem, the pyramid is always in an upright position. However, the pyramid of Numbers in a parasitic food chain is inverted. For example, a single tree supports many fruiteating birds. These birds support more numbers of parasites like lice. These parasites support a large variety of other parasites like bacteria and fungi. **Hence option 1 is correct.**
- **Pyramid of Biomass:**
  - In this approach, individuals in each trophic level are weighed instead of being counted. This gives us a pyramid of biomass, i.e., the total dry weight of all organisms at each trophic level at a particular time.
  - Pyramid of biomass is usually determined by collecting all organisms occupying each trophic level separately and measuring their dry weight.
  - In many ecosystems, such as in forests and grasslands, the biomass of producers is much greater than that of the herbivores, which in turn outweigh the carnivores and so on. Thus, we experience a gradual decline in the biomass of organisms at each hierarchic trophic level. These pyramids are in an upright position. **Hence, option 2 is not correct.**
  - However, in a pond ecosystem, producers are small organisms, so their biomass is also less. But the primary and secondary consumers are bigger, so their biomass is more. Therefore, the value of biomass shows a gradual increase, making it an inverted pyramid. **Hence, option 3 is correct.**
- **Pyramid of Energy:**
  - An energy pyramid, reflects the laws of thermodynamics, with conversion of solar energy to chemical energy and heat energy at each trophic level and with loss of energy being depicted at each transfer to another trophic level. Hence, the pyramid is always upward, with a large energy base at the bottom

Q 46.A

- **Context: Israel launched a strike on Hodeida and al-Salif ports in Yemen, controlled by Houthis.**
- Hodeida and Al-Salif are two critical Yemeni ports located on the Red Sea, primarily used for imports and humanitarian aid, particularly since the beginning of the conflict in 2014. Together with Ras Issa, the ports of Hodeidah and Salif handle about 70% of all Yemen's imports and 80% of all humanitarian assistance.
- Hodeida is the larger of the two and the main entry point for essential goods, while Al-Salif is a deep-water port located northwest of Hodeida. Recent actions, including Israeli strikes on both ports and warnings to evacuate, highlight their strategic importance and vulnerability.

- **Hence, option (a) is the correct answer**

Q 47.A

- Vultures are scavenging birds of prey.
- They have been divided into New World vultures, which include the Californian and Andean condors, and the Old World vultures, which include the White-rumped and Red-headed vultures. New World vultures are found in North and South America; Old World vultures are found in Europe, Africa, and Asia.
- Nine species of vultures exist in India of which five belong to the genus Gyps.
- **Indian Long-billed Vulture(Gyps indicus)**- Indian vulture smaller and less heavily built vulture species breeds mainly on cliffs or human-made structures. The species feeds mostly from carcasses of dead animals and reaches up to the verge of extinction because of the veterinary drug diclofenac. The conservation status (IUCN) of the Indian Long-billed Vulture is **Critically Endangered.**
- **Red-Headed Vulture(Sarcogyps Calvus)**- It is also known as the Indian Black Vulture found only in the Indian Subcontinent. This medium-sized vulture has no subspecies found in deciduous forests and foothills and river valleys. The conservation status (IUCN) of the Red-Headed Vulture is **Critically Endangered.**
- **Himalayan Vulture (Gyps Himalayensis)** Himalayan griffon vulture is one of the two largest old-world vultures and a true raptor, found along the Himalayas in India. This huge bird of prey is the largest and heaviest bird found in the Himalayas of the Indian Subcontinent. The conservation status (IUCN) of Himalayan Vultures is **Near Threatened.**
- **Slender-Billed Vulture (Gyps tenuirostris)**- It is one of the species of old-world vulture found along the Sub Himalayan regions of the Indian Subcontinent. It has suffered an extremely rapid population decline, particularly across India. The conservation status (IUCN) of Slender-Billed Vulture is **Critically Endangered.**
- **White-Rumped Vulture (Gyps bengalensis)**- It is a medium-sized vulture and one of the most abundant large birds of prey in the world. This is the smallest of the Gyps vultures found in India and the most common vulture found in immense numbers all over the country. The conservation status (IUCN) of the White-Rumped Vulture is **Critically Endangered.**
- **Hence, option (a) is the correct answer.**

Q 48.C

- The grazing food chain (GFC) in aquatic ecosystems starts with phytoplankton, which are microscopic autotrophs (producers).
- They perform photosynthesis and form the base of the aquatic food chain, supporting various primary consumers like zooplankton. **Hence, statement 1 is correct.**

- While the grazing food chain dominates in open ocean ecosystems due to the abundance of phytoplankton and zooplankton, detritus food chains (DFC) are not completely absent. Dead organic matter, fecal pellets, and decaying plankton sink to deeper layers of the ocean, forming marine detritus, which is then consumed by decomposers and detritivores (e.g., bacteria, marine worms). Thus, DFC exists, especially in the deep ocean or benthic zones. **Hence, statement 2 is not correct.**
- Zooplankton feed on phytoplankton, making them primary consumers in the grazing food chain. They are then consumed by secondary consumers like small fish or larger planktonic animals. **Hence, statement 3 is correct.**

Q 49.D

- Sacred Groves are the tracts of virgin forests that are left untouched by the local inhabitants and are protected by the local people due to their culture and religious beliefs. Sacred groves are relic vegetation of once-dominant flora. They are repositories of our rich biodiversity; they are also the last bastion where the rich culture and the customs of the indigenous people are still preserved.
- A sacred grove usually consists of a dense cover of vegetation including climbers, herbs, shrubs and trees, with the presence of a village deity and is mostly situated near a perennial water source.
- They are called with different names in different states:
- **Sarna in Bihar. Hence pair 1 is correctly matched.**
- Dev Van in Himachal Pradesh
- Devarakadu in Karnataka.
- Kavu in Kerala.
- Dev in Madhya Pradesh
- Devarahati or Devarai in Maharashtra
- **Lai Umang in Manipur. Hence pair 2 is correctly matched.**
- Law Kyntang or Asong Khosi in Meghalaya
- **Oran in Rajasthan. Hence pair 3 is correctly matched.**
- Kovil Kadu or Sarpa Kavu in Tamil Nadu
- Than in Assam.

Q 50.C

- National parks are given a greater degree of protection. **No human activity is permitted inside the national park except for the ones permitted by the Chief Wildlife Warden of the state**. Only certain areas can be visited and only activities permitted by the chief wildlife warden of the state are allowed in the park. **Hence statement 2 is correct.**
- **National parks can be declared both by the Central Government and State governments.** No alteration of the boundaries of a national park shall be made except on a resolution passed by the State Legislature.
- An area, whether within a sanctuary or not, c**an be notified by the state government to be constituted as a National Park**, because of its ecological, faunal, floral, geomorphological, or zoological association or importance, needed for protecting & propagating or developing wildlife therein or its environment. **Hence statement 1 is correct.**
- National parks provide protection to the entire ecosystem, that is, flora, fauna, landscape, etc. of that region. The national parks **not only conserve wildlife but also provide a diversion of environmental and landscape heritage in a manner that does not harm it, to provide enjoyment to future generations.**

Q 51.B

- The Water (Prevention and Control of Pollution) Act, 1974 defined terms like pollution, sewage effluent, trade effluent, stream, and boards. It defines water pollution and water quality standards.
- **The Act has the following objectives:**
  - To prevent and control water pollution.
  - To maintain or restore the wholesomeness of water.
  - To establish Boards for the prevention and control of water pollution.
- Central Pollution Control Board and the State Pollution Control Board are to implement the work for the objectives of the Act. **Hence statement 2 is correct.**
- The Act provides for the maintenance and restoration of the quality of all types of surface and groundwater. **Hence statement 1 is not correct.**

- The Act prohibits the disposal of any poisonous, noxious, or polluting matter into the flow of water in a stream. However, dumping any material into a stream for the purpose of reclaiming land is not considered an offense.
- The Act provides for severe and deterrent punishments for violations of the Act, which include fines and imprisonment.

Q 52.B

- **The global warming potential (GWP) of human-generated greenhouse gases is a measure of how much heat each gas traps in the atmosphere, relative to carbon dioxide.**
- The Global Warming Potential (GWP) was developed to allow comparisons of the global warming impacts of different gases. It is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of carbon dioxide (CO2).
- The larger the GWP, the more that a given gas warms the Earth compared to CO2 over that time period. The time period usually used for GWPs is 100 years.

Greenhouse Gases	Atmospheric lifetime (yrs)	GWP	Sources/Causes
Carbon Dioxide (CO_2)	50-200	1	Burning of fossil fuels, deforestation
Methane (CH_4)	12±3	21	Growing paddy, excreta of cattle and other livestock, termites, burning of fossil fuels, wood, landfills.
Nitrous Oxide (N_2O)	120	310	Burning of fossil fuels, fertilizers; burning of crop residue
Hydrofluorocarbons (HFCs)	1.5 to 209	150 to 11700	Primarily produced for **use in refrigeration, air-conditioning,** insulating foams and aerosol propellants
Perfluorocarbons (PFCs)	2600 to 50000	6500 to 9200	The **aluminum smelting** industry has been a major source of atmospheric perfluorocarbons.
Sulfur Hexafluoride (SF_6)	3200	23900	SF6 is a substance which originates **only from anthropogenic sources** used primarily in the electricity and electronics supply industries, e.g., the semiconductor industry, where it is used as an electronic insulator due to its inertness.

- **Hence, option (b) is the correct answer.**

Q 53.B

- No species can live in isolation in a habitat and results in Interspecific interactions that arise from the interaction of populations of two different species. These interactions could be beneficial, detrimental, or neutral to one of the species or both. In nature, animals, plants, and microbes interact in various ways to form a biological community. Many interactive linkages exist even in minimal communities.

Species A	Species B	Name of Interaction
+	+	*Mutualism*
–	–	*Competition*
+	–	*Predation*
+	–	*Parasitism*
+	0	*Commensalism*
–	0	*Amensalism*

- **+ sign denotes Beneficial interactions**
- **- sign denotes Detrimental Interactions**
- **0 denotes neutral Interactions**

- **Pitcher plant-eating insects is an example of Predation where Species A (Pitcher plant) is getting the benefit at the cost of species B (Insect) where Pitcher plant is predator and insect is prey. Hence, pair 1 is correctly matched.**
- **Plants in the evergreen forests are fighting for sunlight, which negatively affects their growth. It is an example of competitive interaction where plants are competing for the same source i.e. sunlight. Hence, pair 2 is correctly matched.**
- **Sparrow-eating seed is an example of Predation where sparrow is getting benefited at the cost of seeds. Hence, pair 3 is not correctly matched.**

Q 54.A

- Measuring the diversity of a species generally incorporates estimates of "richness". Also referred to as alpha-diversity, species richness is a common way of measuring biodiversity and involves counting the number of individuals - or even families - in a given area. **Hence, pair 1 is not correctly matched.**
- At the ecosystem-level, measures of biodiversity are often used to compare two ecosystems or to determine changes over time in a given region. **Describing changes in biodiversity within or between ecosystems is called beta-diversity.** Measures of beta-diversity indicate the difference in species richness between two different habitats or within a single community at different points in time. The resulting number indicates to researchers whether there is any overlap in the species found in each group. **Hence, pair 2 is not correctly matched.**
- **Gamma-diversity, on the other hand, estimates the total biodiversity within an entire region. Hence, pair 3 is correctly matched.**

Q 55.C

- **Photochemical smog is a mixture of pollutants that are formed when nitrogen oxides and volatile organic compounds (VOCs) react to sunlight, creating a brown haze above cities. It occurs in warm, dry, and sunny climates**. The main components of the photochemical smog result from the action of sunlight on unsaturated hydrocarbons and nitrogen oxides produced by automobiles and factories. **Hence, statement 1 is correct.**
- Photochemical smog has a **high concentration of oxidizing agents and is, therefore, called oxidizing smog**. **Hence, statement 2 is correct.**
- **The common components of photochemical smog are ozone, nitric oxide, acrolein, formaldehyde, and peroxyacetyl nitrate (PAN).** Photochemical smog causes serious health problems. Both ozone and PAN act as powerful eye irritants. Ozone and nitric oxide irritate the nose and throat and their high concentration causes headache, chest pain, dryness of the throat, cough and difficulty in breathing.

Q 56.D

- **Sources of soil pollution:**
- **Municipal Sources**: Different types of municipal wastes **dumped on the ground cause bad impacts on soil.** These wastes act as shelter homes of various types of insects and germs of diseases.
- **Domestic Sources of Soil Pollution:** Wastes produced due to domestic activities are called as domestic wastes. Food leftovers, peeling of fruits and vegetables, ash, paper bits, packets, polythene bags, glass bottles, tin cans, used tyres, expired medicines etc. are some examples of domestic wastes that are often dumped on the ground. These wastes alter the soil composition and make it bad for the growth and development of plants.
- **Mining Sources:** Mining activities cause long-lasting damage to the soil. Tailings, slags, stones etc. that come out of mines are dumped near them. Besides these, different types of toxic chemicals are exposed due to mining which further cause serious soil and water pollution during rains.
- **Wastes:** The electronic wastes generated through the disposal of **electronic goods**, like computers, televisions, wires, and plastic cabinets etc. which are often dumped on the ground, create serious pollution on land
- **Agricultural Sources:** Agro- chemicals used in agriculture produce adverse effects on soil. Synthetic fertilizers, pesticides, and herbicides if used continuously for a long time alter the composition of soil, making it unfit for the growth and development of plants. Faulty irrigation practices cause waterlogging. The water is evaporated in the sun leaving behind salts in the soil. Thus soil gradually becomes saline and unfit for plant growth.
- **Industrial Sources:** Industries dump lots of wastes on land. These wastes create ugly scenes on the ground and contaminate soil making it unfit for productive utilization. A number of toxic wastes seep into the ground and cause underground water pollution. **Fly ash from thermal power plants is also a major soil pollutant. Hence, option (d) is the correct answer.**

Q 57.D

- **National Adaptation Fund on Climate Change (NAFCC) was launched in 2015** with an initial outlay of Rs. 350 crores to meet the cost of adaptation to climate change for the State and Union Territories of India that are particularly vulnerable to the adverse effects of climate change.
- The overall aim of the fund is to support concrete adaptation activities which are not covered under ongoing activities through the schemes of the State and National Governments that reduce the adverse effects of climate change facing communities, sectors, and states. T**he Scheme has been taken as Central Sector Scheme with National Bank for Agriculture and Rural Development (NABARD) as the National Implementing Entity (NIE). Hence, option (d) is the correct answer.**

Q 58.B

- **The CHIPKO (1973, Uttarakhand), the APPIKO (1983, Karnataka)**, the Social Fencing of Shivalik Hills (1986), **the Silent Valley Movement (1973, Kerala)** and Joint Forest Management (J.F.M.) in West Bengal (1981, MidnaPur, Bankura and Purulia districts), are some examples of conservation and management of forests through the efforts of local communities in India. Inspired by the J.F.M. in Bengal, the Joint Forest Management was introduced in India, on government level in 1990. **Hence option (b) is the correct answer.**

Q 59.D

- Until 1994, environmental clearance from the Central Government was an administrative decision and lacked legislative support.
- On 27 January 1994, the Union Ministry of Environment and Forests (MEF), **Government of India, under the Environmental (Protection) Act 1986**, promulgated an EIA notification making Environmental Clearance (EC) mandatory for expansion or modernisation of any activity or for setting up new projects listed in Schedule 1 of the notification. Since then, there have been 12 amendments made to the EIA notification of 1994. **Hence, statement 1 is not correct.**
- Even though some of the industrial units do not require EIA as per the statutory norms, even if they might involve certain technological processes which could be harmful to the environment, as a result of which such listed industries could have potential impacts on the environment and on public health.
- Unlike Category A and B1 projects, Category B2 projects, such as irrigation projects (2,000–10,000 ha), small and medium cement plants, oil and gas exploration, and hydroelectric projects up to 25 MW, are exempt from mandatory environmental clearance. **Hence statement 2 is not correct.**

Q 60.A

- **Context: NASA's GRAIL Mission created the most detailed map of the Moon's gravity.**
- Gravity Recovery and Interior Laboratory (GRAIL) was a dual-spacecraft mission that involved placing two identical spacecraft in orbit around the **Moon to use high-quality gravitational field mapping to determine its internal structure.** The mission was the 11th in NASA's Discovery Program. The names "Ebb" and "Flow" were given to GRAIL-A and GRAIL-B, respectively after a national contest won by the fourth-grade students at Emily Dickinson Elementary School in Bozeman, Montana. **Hence, statement 1 is correct.**
- The **GRAIL Mission was launched in 2011 as a part of the NASA Discovery Program.** This mission was conducted by NASA's Jet Propulsion Laboratory (JPL) in collaboration with MIT for scientific oversight. **Hence, statement 2 is not correct.**
- **Key findings of the mission**
  - Uneven Moon Interior: The Moon's nearside (facing Earth) is warmer and more geologically active than the farside (never visible from Earth).
  - Tidal Deformation: Earth's gravity causes the nearside to flex more than the farside during the Moon's orbit. This flexing shows structural differences between the two sides of the Moon. Nearside is covered by vast plains (called mare), but the farside has much more rugged terrain.

Q 61.B

- **Biodiversity conservation**: When we conserve and protect the whole ecosystem, its biodiversity at all levels is protected - we save the entire forest to save the tiger. This approach is called in situ (on-site) conservation. However, when there are situations where an animal or plant is endangered or threatened and needs urgent measures to save it from extinction, ex-situ (off-site) conservation is the desirable approach.

- **In-situ conservation is the on-site conservation of genetic resources in natural populations of plant or animal species.** In India, ecologically unique and biodiversity-rich regions are legally protected as **biosphere reserves, national parks, sanctuaries, reserved forests, protected forests, and nature reserves**. India has also a history of religious and cultural traditions that emphasized the protection of nature. In many cultures, tracts of forest were set aside, and all the trees and wildlife within were venerated and given total protection. In Meghalaya, the sacred groves are the last refuge for a large number of rare and threatened plants. **Sacred groves are a fine example of in-situ conservation.**
- **Ex situ Conservation–In this approach, threatened animals and plants are taken out from their natural** habitat and placed in special settings where they can be protected and given special care. **Zoological parks, botanical gardens, and wildlife safari parks serve this purpose**. In recent years ex-situ conservation has advanced beyond keeping threatened species in enclosures. Now gametes of threatened species can be preserved in viable and fertile conditions for long periods using cryopreservation techniques, eggs can be fertilized in vitro, and plants can be propagated using tissue culture methods. Seeds of different genetic strains of commercially important plants can be kept for long periods in seed banks.
- **Hence option (b) is the correct answer.**

Q 62.B

- Adaptation is an attribute of the organism (morphological, physiological, behavioral) that enables the organism to survive and reproduce in its habitat. Many adaptations have evolved over a long evolutionary time and are genetically fixed.
- In the absence of an external source of water, the kangaroo rat in North American deserts is capable of meeting all its water requirements through its internal fat oxidation (in which water is a by-product). It also has the ability to concentrate its urine so that a minimal volume of water is used to remove excretory products.
- Many desert plants have a thick cuticle on their leaf surfaces and have their stomata arranged in deep pits (sunken) to minimize water loss through transpiration. They also have a special photosynthetic pathway (CAM) that enables their stomata to remain closed during the daytime. Some desert plants like Opuntia, have no leaves – they are reduced to spines– and the photosynthetic function is taken over by the flattened stems.
- Mammals from colder climates generally have shorter ears and limbs to minimize heat loss. This is called Allen's Rule.
- **Allen's rule states that mammals from colder climates generally have shorter ears and limbs to minimise heat loss. A smaller body surface area helps animals in colder regions stay warm by slowing down the loss of body heat. It is named after American biologist Joel Asaph Allen who proposed it in his 1877 paper "The influence of physical conditions in the genesis of species".**
- **Hence, option (b) is the correct answer.**

Q 63.B

- **Context: Recently an analysis revealed that of the outbreaks reported in Integrated Disease Surveillance Programme, 8.3% were zoonotic, with a median of seven monthly zoonotic outbreaks.**
  - **Zoonotic diseases, or zoonoses, are infectious diseases that can be transmitted between animals and humans**. **These diseases are caused by various pathogens like bacteria, viruses, parasites, and fungi.** Transmission can occur through direct contact with animals, their bodily fluids, or through contaminated food, water, or the environment. **Hence, statement 1 is correct but statement 2 is not correct.**
  - Globally, about millions of deaths occur every year from zoonoses and 60% of reported emerging infectious diseases globally are zoonoses.
  - Japanese encephalitis accounted for 29.5% of zoonotic outbreaks, followed by leptospirosis and scrub typhus. **Northeast region contributed to around one-third of zoonotic disease outbreaks, followed by Southern region. Hence, statement 3 is correct.**

Q 64.B

- **The Minamata Convention** on Mercury is the most recent global agreement on environment and health, adopted in **2013.** It addresses the entire life cycle of mercury, from its supply and trade to its use, emissions, releases, storage, and waste management. The treaty is named after Minamata Bay in Japan, where mercury pollution caused severe health damage.

- **The Convention** on the **Prevention of Marine Pollution by Dumping of Wastes** and Other Matter 1972, commonly called the "**London Convention" or "LC '72**" and also abbreviated as Marine Dumping, is an agreement to control pollution of the sea by dumping and to encourage regional agreements supplementary to the Convention. **Hence option (b) is the correct answer.**
- **In March 1985,** 28 countries of the world agreed on the Vienna Convention for the Protection of the ozone layer. In September 1987, different countries of the world adopted **the Montreal Protocol** on substances that deplete the ozone layer.
- **The Bonn Convention**, formally known as the Convention on the Conservation of Migratory Species of Wild Animals (CMS), is an international treaty under the United Nations Environment Programme (UNEP) dedicated to the conservation and sustainable use of migratory animals and their habitats according to the Convention on the Conservation of Migratory Species (CMS)**. It was established in 1979** and entered into force in 1983. The convention provides a global platform for cooperation among countries to protect migratory species and their habitats across their entire range.

Q 65.C

- Adaptation of animals in the desert ecosystem:
  - **Many desert animals, including rodents, reptiles, and insects, are nocturnal.** Being active at night helps them avoid the intense heat of the day and reduce water loss through evaporative cooling.
  - **Animals have long legs and ears that help dissipate heat, allowing them to regulate their body temperature more effectively.**
  - Desert animals have developed various mechanisms to conserve water, such as **producing concentrated urine, excreting solid waste, and minimizing sweating.**
  - Desert animals exhibit behavioral adaptations to reduce water loss, such as seeking shade during the day and burrowing underground.
  - **Hence, option (c) is the correct answer.**

Q 66.A

- **Eutrophication refers to the process by which a body of water becomes progressively enriched with minerals and nutrients.**
- **While eutrophication** can **occur naturally as lakes age and accumulate nutrients**, it is primarily accelerated and **exacerbated by human activities,** a process known as cultural or anthropogenic eutrophication. **Hence statement 1 is not correct.**
- **The prime contaminants are nitrates and phosphates, which act as plant nutrients**. They overstimulate the growth of algae, causing unsightly scum and unpleasant odors, and robbing the water of dissolved oxygen vital to other aquatic life. **Hence statement 2 is correct.**
- **Eutrophication supports a dense plant population, the decomposition of which kills animal life by depriving it of oxygen.** Phytoplankton (algae and blue-green bacteria) thrive on the excess nutrients and their population explosion covers almost the entire surface layer. **Hence statement 3 is not correct.**

Q 67.C

- **As water is an excellent solvent, water-soluble inorganic chemicals that include heavy metals such as cadmium, mercury, nickel, etc constitute an important class of pollutants.** All these metals are dangerous to humans because our bodies cannot excrete them. Over time, it crosses the tolerance limit. These metals then can damage kidneys, central nervous system, liver, etc.
- **Fluoride:** Fluoride: For drinking purposes, water should be tested for fluoride ion concentration. **Its deficiency in drinking water is harmful to man and causes diseases such as tooth decay etc**. Soluble fluoride is often added to drinking water to bring its concentration up to 1 ppm. At the same time, excess fluoride (over 10 ppm) causes harmful effects to bones and teeth, as reported from some parts of Rajasthan. **Hence statement 1 is correct.**
- **Lead:** Drinking water gets contaminated with lead when lead pipes are used for the transportation of water. The prescribed upper limit concentration of lead in drinking water is about 50 ppb. **Lead can damage the kidney, liver, reproductive system, etc. Hence statement 2 is correct.**

Q 68.B

- Biomagnification, also known as bioamplification, is the process by which substances become more concentrated in the bodies of consumers as one moves up the food chain (trophic levels). When chemicals or pesticides are let into rivers or lakes they are consumed by aquatic organisms like fish, which in turn are consumed by large birds, animals or humans. These harmful substances become concentrated in tissues, and internal organs as it move up the food chain. As against this, bioaccumulation occurs within a trophic level and is the increase in the concentration of a substance in certain tissues (usually in fatty tissue.) of organisms' bodies due to absorption from food and the environment. **Hence, statement 1 is correct.**
- Toxins that are lipophilic (fat-soluble), such as DDT, PCBs, and mercury compounds, are stored in the fatty tissues of organisms. These are not easily excreted and accumulate over time, especially in top predators. **Hence, statement 2 is correct.**
- Biomagnification affects organisms at the top of the food chain the most (like large fish, birds of prey, and humans). Primary producers (like phytoplankton or plants) are the initial entry points for toxins but do not experience high concentrations because they do not consume others. **Hence, statement 3 is not correct.**

Q 69.C

- Conservation International was a pioneer in defining and promoting the concept of hotspots. In 1989, just one year after scientist Norman Myers wrote the paper that introduced the hotspots concept, Conservation International adopted the idea of protecting them as the guiding principle of their investments.
- Hot spots are regions with very high levels of species richness and a high degree of endemism (that is, species confined to that region and not found anywhere else) that are under constant threat.
- To qualify as a biodiversity hotspot, a region must meet two strict criteria:
- **It must have at least 1,500 vascular plants as endemics** — which is to say, it must have a high percentage of plant life found nowhere else on the planet. A hotspot, in other words, is irreplaceable.
- It must have 30% or less of its original natural vegetation. In other words, **it must be threatened.**
- **The mere presence of invasive species is not a criteria to identify biodiversity hotspots.**
- **Hence option (c) is the correct answer.**

Q 70.A

- Wildlife (Protection) Act, 1972 was enacted for the protection of both plant and animal species. **Hence statement 3 is not correct.**
- The primary purpose of enacting this was to maintain ecological processes and life-supporting systems to preserve biodiversity and to ensure continuous use of species i.e., protection and conservation of wildlife through in-situ conservation like national parks and development of selected Ex-situ conservation areas like Zoological and Botanical Gardens. **Hence statement 2 is correct.**
- Prior to this legislation, India had only five designated national parks. At present, there are 107 existing national parks in India covering an area of 43,716 km2, which is 1.33% of the geographical area of the country (National Wildlife Database, Dec. 2020).
- **Salient Features of the Act:**
    - It prohibits the hunting of any wild animal specified in Schedules I, II, III, and IV of the act.
    - **A wild animal listed under these schedules can be hunted/ killed only after getting permission from the Chief Wildlife Warden (CWLW) of the state if:**
    - It becomes dangerous to human life or to property (including standing crops on any land), or is disabled or suffering from a disease that is beyond recovery.
    - It prohibits the uprooting, damage, collection, possession, or selling of any specified plant from any forest land or any protected area.
    - The CWLW, however, may grant permission for uprooting or collecting a specific plant for the purpose of education, scientific research, preservation in a herbarium, or if a person/institution is approved to do so by the central government.
    - The State Governments appoint a Chief Wildlife Warden (CWLW) who heads the Wildlife Wing of the department and exercises complete administrative control over Protected Areas (PAs) within a state. **Hence statement 1 is not correct.**
    - It provides for the constitution of bodies to be established under this act, such as the National and State Board for Wildlife, Central Zoo Authority, and National Tiger Conservation Authority.
    - The Central Government appoints the Director of Wildlife Preservation and assistant directors and other officers subordinate to the Director.
    - The state governments are also entitled to appoint Wildlife Wardens in each district.

Q 71.C

- **The "Panchamrita" strategy, was announced by Prime Minister Narendra Modi at the 26th Conference of the Parties (COP26) to the United Nations Framework Convention on Climate Change (UNFCCC) held in Glasgow, United Kingdom.** Under the Panchamrit strategy, India presented the following five nectar elements (Panchamrit) of India's climate action:
  - **Non-Fossil Energy Capacity: India will increase its non-fossil energy capacity to 500 GW by 2030. Hence, statement 1 is correct.**
  - Renewable Energy Share: India will meet 50% of its energy requirements from renewable energy by 2030.
  - Reduction in Carbon Emissions: India will reduce its total projected carbon emissions by 1 billion tonnes from now until 2030.
  - Hence, option (b) is the correct answer.
  - Carbon Intensity Reduction: India will reduce the carbon intensity of its economy by 45% by 2030, compared to 2005 levels.
  - **Net-Zero Target: India will achieve the target of net-zero carbon emissions by 2070.Hence, statement 2 is correct.**

Q 72.D

- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement between Governments. It aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival.
- CITES was drafted as a result of a resolution adopted in 1963 at a meeting of members of the International Union for Conservation of Nature (IUCN).
- CITES entered into force in July 1975. Currently, there are 183 Parties (including countries or regional economic integration organizations).
- The CITES Secretariat is administered by UNEP (The United Nations Environment Programme) and is located in Geneva, Switzerland. **Hence statement 1 is not correct.**
- CITES is legally binding on the Parties; it does not take the place of national laws. **Hence statement 2 is not correct.**
- It provides a framework to be respected by each Party, which has to adopt its own domestic legislation to ensure that CITES is implemented at the national level.
- **Appendix I:**
  - It lists species that are the most endangered among CITES-listed animals and plants.
  - They are threatened with extinction, and CITES prohibits international trade in specimens of these species except when the purpose of the import is not commercial, for instance, for scientific research.
- **Appendix II:**
  - **It lists species that are not necessarily now threatened with extinction but that may become so unless trade is closely controlled.**
- **Appendix III:**
  - **It is a list of species included at the request of a Party that already regulates trade in the species and that needs the cooperation of other countries to prevent unsustainable or illegal exploitation.**
  - International trade in specimens of species listed in this Appendix is allowed only on presentation of the appropriate permits or certificates.

Q 73.A

- According to the IUCN, the total number of plant and animal species described so far is slightly more than 1.5 million, but we have no clear idea of how many species are yet to be discovered and described.
- Some interesting aspects about the earth's biodiversity based on the currently available species inventories:
- **More than 70 per cent of all the species recorded are animals**, while **plants (including algae, fungi, bryophytes, gymnosperms and angiosperms) comprise no more than 22 per cent of the total**.
- **Among animals, insects are the most species-rich taxonomic group**, making up more than 70 per cent of the total. That means, out of every 10 animals on this planet, 7 are insects.
- The **number of fungi species in the world is more than the combined total of the species of fishes, amphibians, reptiles and mammals**.
- **Hence, option (a) is the correct answer.**

Q 74.B

- Mycoremediation is the use of fungi, especially their mycelium, to degrade or remove toxic pollutants from soil, water, and air.
- Myco = fungus; remediation = cleanup or detoxification.
- Fungi secrete powerful enzymes (like lignin peroxidase, laccase) that can break down complex organic compounds, including:
  - Petroleum products
  - Pesticides
  - Heavy metals
  - Dyes and industrial effluents
- Example: White rot fungus used to degrade polycyclic aromatic hydrocarbons (PAHs). **Hence, option (b) is the correct answer.**
- **Phytoremediation**
  - Phytoremediation is the use of plants (not fungi) to absorb, accumulate, degrade, or detoxify pollutants.
  - It's commonly used for:
  - Heavy metals like arsenic, lead
  - Organic pollutants like pesticides
  - Water purification
  - Example: Indian mustard for lead extraction from soil.
- **Bioleaching**
  - Bioleaching involves microorganisms (usually bacteria) to extract metals from ores.
  - Used in mining and metallurgy, not primarily for environmental detoxification.
  - Example: Thiobacillus ferrooxidans used to extract copper from low-grade ore.
- **Vermicomposting**
  - Vermicomposting uses earthworms to decompose organic matter and convert it into nutrient-rich compost.
  - It is a form of organic waste management, not specifically for hazardous pollutants.

Q 75.A

- Sacred groves comprise patches of forests or natural vegetation, from a few trees to forests of several acres, that are usually dedicated to local folk deities. A sacred grove is identified by local names according to each state. In Maharashtra, it is called Devrai, Sarana in Jharkhand, Sarpa Kavu in Kerala and Koil Kadu in Tamil Nadu. But few are preserved properly. These spaces are protected by local communities because of their religious beliefs and traditional rituals that run through several generations. **Hence statement 1 is correct.**
- In India, sacred groves are found all over the country and abundantly along the Western Ghats in the states of Kerala and Karnataka. The highest number of SGs is in Himachal Pradesh (nearly 5,000) and the lowest in Uttarakhand (around 22). Kerala has around 2,000 of them.
- The degree of sanctity of the sacred forests varies from one grove to another. In some forests, even the dry foliage and fallen fruits are not touched. People believe that any kind of disturbance will offend the local deity, causing diseases, natural calamities, or the failure of crops. For example, the Garo and the Khasi tribes of northeastern India completely prohibit any human interference in the sacred groves. In other groves, deadwood or dried leaves may be picked up, but the live tree or its branches are never cut. For example, the Gonds of central India prohibit the cutting of a tree but allow fallen parts to be used. **Hence statement 2 is not correct.**

Q 76.B

- The Central Zoo Authority is the government body responsible for overseeing zoos constituted under the Wildlife (Protection) Act, 1972. **Hence statement 1 is not correct.**
- **Functions of the Central Zoo Authority**
  - Specify the minimum standards for housing, upkeep, and veterinary care of the animals kept in zoos.
  - Evaluate and assess the functioning of the zoos with respect to the prescribed standards or norms.
  - Recognize or derecognize zoos.
  - Identify endangered species of wild animals for purposes of captive breeding.
  - Provide technical and financial assistance to such zoos which have the potential to attain the desired standard in animal management.

- Regulate the exchange of animals of the endangered category listed under Schedule-I and II of the Wildlife (Protection) Act among zoos. **Hence statement 2 is correct.**
- Exchange of animals between Indian and foreign zoos is approved by the Authority before the requisite clearances under the EXIM Policy, and the CITES permits are issued by the competent authority.

Q 77.A

- **Genetic diversity refers to the diversity (or genetic variability) within a single species.** Each individual species possesses genes that are the source of its own unique features: In human beings, for example, the huge variety of people's faces reflects each person's genetic individuality. The term genetic diversity also covers distinct populations of a single species, such as the thousands of breeds of different dogs or the numerous variety of roses.
- Human beings genetically belong to the homo sapiens group and also differ in their characteristics such as height, colour, physical appearance, etc., considerably. This is due to genetic diversity
- The huge variety of different gene sets define an individual or a whole population's ability to tolerate stress from any given environmental factor. Genetic Diversity is also important with respect to the adaptability of species to varied environments with special reference to changing climatic conditions. So higher is the Genetic diversity greater are the chances of adapting to the Environmental changes and thus more confirmed is the survival of the species.
- **Hence, option (a) is the correct answer.**

Q 78.A

- On 1 January 2016, the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development — adopted by world leaders in September 2015 at an historic UN Summit — officially came into force. **Sustainable Development Goals (SDGs)-13 deals with Climate Action: Take urgent action to combat climate change and its impacts. Hence statement 1 is correct.**
- **The SDG India Index and Dashboard is a crucial tool in India's SDG monitoring efforts. Designed and developed by NITI Aayog,** the Index measures the progress at the national and sub-national levels in our journey towards meeting the Global Goals and targets. It has also been successful as an advocacy tool to propagate the messages of sustainability, resilience, and partnerships. **Hence statement 2 is not correct.**

Q 79.B

- **Recent Context: To revive the population of tigers in Sahyadri Tiger Reserve (STR) — the lone tiger reserve in the Maharashtra western region — the state's forest department will soon translocate tigers from Tadoba-Andhari Tiger Reserve (TATR) in Chandrapur district.**
- **The Sahyadri Tiger Reserve, located in the Sahyadri Ranges of Western Ghats**, was established in January 2010 and straddles Kolhapur, Satara, Sangli, and Ratnagiri districts in western Maharashtra. It comprises of rich evergreen, semi-evergreen and moist deciduous forests. It is the first Tiger Reserve of Western Maharashtra and the fourth Tiger Reserve of the State spreading over two Protected Areas of Koyana Sanctuary (KWLS) and Chandoli National Park (CNP).
- **Hence, option (b) is the correct answer.**

Q 80.D

- **Primary producers:** including bacteria, phytoplankton, and algae — form the lowest trophic level, the base of the aquatic food web. Primary producers synthesize their own energy without needing to eat. Many photosynthesize, using the sun's energy to build carbohydrates. However, some primary producers can create energy without sunlight using chemosynthesis to metabolize chemicals released from hydrothermal vents, methane seeps, and other geological features.
    - **The two main classes of phytoplankton are dinoflagellates and diatoms**. Dinoflagellates use a whip-like tail, or flagella, to move through the water and their bodies are covered with complex shells. Diatoms also have shells, but they are made of a different substance and their structure is rigid and made of interlocking parts.
- **Consumers:** Zooplankton feed on microscopic plant-like organisms called phytoplankton, which get their energy from the sun. **Tiny crustacean zooplankton called "copepods" are like cows of the sea, eating the phytoplankton and converting the sun's energy into food for higher trophic levels in the food web.** Copepods are some of the most abundant animals on the planet.
- **Predators** more actively feed on other animals. There are many kinds of predators that feed on many kinds of prey. Pursuit predators like sharks, box jellyfish, sunflower sea stars, and many fish like **herring**, cod, and tuna hunt for their prey. Ambush predators like mantis shrimp, some octopuses, some eels, and scorpionfish, capture their prey by hiding and suddenly attacking.
- **Hence option (d) is the correct answer.**

Q 81.A

- The Wild Life (Protection) Amendment Act 2022 aims to modernize and strengthen India's wildlife protection laws. By addressing contemporary problems such as invasive species and complying with international norms, the act strengthened India's commitment to biodiversity protection and sustainable wildlife management. The previous six schedules have been reduced to four, with improved protection for specially protected animals. The removal of the vermin species schedule demonstrates a more focused approach, while a new schedule for CITES-listed specimens is implemented.
- **Schedule-I:** Animal Species with the highest level of protection. For Example- Tiger, Blackbuck, Himalayan Brown Bear, Brow Antlered Deer, Blue Whale, Common Dolphin, Cheetah, Snow Leopard, Hornbills, etc. **Hence pair 1 is correctly matched.**
- **Schedule-II:** Animal species with a lesser level of protection. For example- Nilgal, Indian Flying Fox, Spotted Deer, Wild Pig, Nicobar Shrew, etc. **Hence pair 2 is not correctly matched.**
- **Schedule-III**: Protected plant species. For example- Kurinji, Tree Turmeric, Pitcher Plant, Red Vanda, Daffodil orchid, etc**. Hence pair 3 is not correctly matched.**
- **Schedule-IV:** Protected plant Specimens listed in the Appendices under CITES.

Q 82.B

- Joint Forest Management (JFM) is an approach and program wherein state forest departments support local forest-dwelling and forest fringe communities to protect and manage forests and share the costs and benefits from the forests with them. **Hence statement 1 is not correct.**
- Communities organize themselves into a JFM Committee to protect and manage nearby forests, guided by locally prepared bylaws and micro plans.
- The key element in JFM is that communities have the power to manage the use of forests by members and also exclude non-members.
- The benefits to them are direct access and control over the use and sale of most Non Timber Forest Produce and a share in the income from timber, as well as other intangible benefits from local ecosystem services, like water recharge, pollination, wildlife habitat, etc. Thus involvement of communities in the conservation of forests and wildlife is of paramount interest.
- Joint Forest Management (JFM) was first recognized under the National Forest Policy of 1988. Following this policy, the Government of India issued guidelines on June 1, 1990, outlining the framework for JFM. This framework encouraged the involvement of local communities in the protection, regeneration, and development of degraded forest lands. **Hence statement 2 is correct.**
- **National Forest Policy of 1988 marked a shift towards recognizing the needs of local communities and their involvement in forest management. It emphasized the importance of fuel wood, fodder, and small timber for rural populations.**

Q 83.C

- **The Kyoto Protocol** is an agreement made under the UNFCCC. Countries that ratify this protocol commit to reduce their emissions of carbon dioxide and five other greenhouse gases (Methane, Nitrous Oxide, Sulphur Hexafluoride, Hydrofluorocarbons and Perfluorocarbons), or engage in emissions trading if they maintain or increase emissions of these gases.
- **The Kyoto Protocol introduced three mechanisms in order to achieve its goals: the Clean Development Mechanism (CDM), Joint Implementation (JI), and Emissions Trading (ET).**
  - **The CDM allows countries with commitments under the Kyoto Protocol to invest in emission reduction projects in developing countries.** These projects can involve, for example, a rural electrification project using solar panels or the installation of more energy-efficient boilers.
  - **JI mechanism** allows a country with a Kyoto Protocol emission reduction target to invest in a project to reduce emissions in any other country with a commitment (as opposed to a developing country).
  - **The Emissions Trading (**The International Emission Trading) scheme under the Kyoto Protocol set up a platform where carbon units, or units generated by projects registered under the JI or the CDM, or from removals through forestry activities, can be exchanged, i.e. sold and purchased, according to a country's needs. The scheme made carbon a commodity and created a carbon market. **Hence, option (c) is the correct answer.**

Q 84.A

- **Context: Under the approved model HAL will compete with private industry to manufacture the indigenous 5th generation fighter jet aircraft named Advanced Medium Combat Aircraft (AMCA).**
  - **The F-35 Lightning II is a 5th-generation multirole stealth fighter developed by the United States**, primarily by Lockheed Martin. France has its own 4.5 generation fighter – Dassault Rafale – but does not currently operate or manufacture a 5th generation fighter aircraft. **Hence, pair 1 is not correctly matched.**
  - **The Sukhoi Su-57 is Russia's first operational 5th-generation stealth fighter aircraft developed by Sukhoi,** under the United Aircraft Corporation. It is designed for air superiority and attack operations and features stealth, supermanoeuvrability, and advanced avionics. **Hence, pair 2 is correctly matched.**
  - **The Chengdu J-20 is a 5th-generation stealth fighter aircraft developed by China, not Japan.** It was developed by the Chengdu Aerospace Corporation and is operated by the People's Liberation Army Air Force (PLAAF). Japan is developing its own 6th-generation fighter (F-X). **Hence, pair 3 is not correctly matched.**

Q 85.A

- **Noise is a type of atmospheric pollution.** The term 'Noise Pollution' has not been defined anywhere in the central legislative. However, the term has been described in the Environmental Protection Act, 1986 as an environmental pollutant.
  - Air (Prevention and Control of Pollution) Act, 1981 included 'Noise' as air pollution.
  - T**he Central Pollution Control Board has laid down the permissible noise levels in India for different areas:**
    - Industrial Area: 75 dB for daytime and 70 dB at night
    - Commercial Area: 65 dB and 55 dB during day and night respectively.
    - Residential Area: 55 dB and 45 dB during day and night respectively. **Hence, statement 1 is correct**.
- **According to the Noise Pollution (Regulation and Control) Rules, 2000, an area comprising not less than 100 meters around hospitals,** educational institutions and courts may be declared (by the State Government) **as a silence area/zone for the purpose of these rules**. **Hence, statement 2 is not correct.**

Q 86.C

- **Acid rain refers to the ways in which acid from the atmosphere is deposited on the earth's surface. Oxides of nitrogen and sulfur** which are acidic in nature can be blown by the wind along with solid particles in the atmosphere and finally settle down either on the ground as dry deposition or in water, fog and snow as wet deposition. **Hence, statement 1 is correct.**

- Acid rain, or acid deposition, is a broad term that includes any form of precipitation with acidic components, such as sulfuric or nitric acid that fall to the ground from the atmosphere in wet or dry forms. **Normally rainwater has a pH of 5.6 due to the presence of H+ ions formed by the reaction of rainwater with carbon dioxide present in the atmosphere. When the pH of the rainwater drops below 5.6, it is called acid rain. Hence, statement 2 is correct.**
- **It corrodes water pipes resulting in the leaching of heavy metals such as iron, lead, and copper into the drinking water.** Acid rain is harmful to agriculture, trees, and plants as it dissolves and washes away nutrients needed for their growth. **Hence, statement 3 is correct.**

Q 87.A

- **Stratospheric ozone is formed naturally through the interaction of solar ultraviolet (UV) radiation with molecular oxygen (O2).** Here, it forms the "ozone layer," which is approximately 6-30 miles above the Earth's surface. T**his layer shields us from the harmful UV radiation emanating from the sun. Hence, statement 3 is correct.**
- **Ground level or tropospheric ozone is created by chemical reactions between oxides of nitrogen (NOx gases) and volatile organic compounds (VOCs). Ozone in the troposphere is considered a greenhouse gas** and contributes to global warming. It is also a common constituent of Photochemical smog. **Hence, statement 2 is correct.**
- **Ozone is thermodynamically less stable than oxygen and decomposes into molecular resulting in the liberation of heat.** Ozone consists of three molecules of oxygen and is thus in an unstable state. So in order to get stable, it gives up one molecule of oxygen to restore the diatomic state.
- Thus, a dynamic equilibrium exists between the production and decomposition of ozone molecules. In recent years, there have been reports of the depletion of this protective ozone layer because of the presence of certain chemicals in the stratosphere. The main reason for ozone layer depletion is believed to be the release of chlorofluorocarbon compounds (CFCs), also known as freons. **Hence statement 1 is not correct.**

Q 88.B

- **Ozone in the stratosphere is a product of UV radiations acting on dioxygen (O2) molecules.** The UV radiations split apart molecular oxygen into free oxygen (O) atoms. Ozone is thermodynamically unstable and decomposes to molecular oxygen. Thus, a dynamic equilibrium exists between the production and decomposition of ozone molecules.
- The **main reason for ozone layer depletion is the release of chlorofluorocarbon compounds (CFCs), also known as freons**. These compounds are nonreactive, nonflammable, **nontoxic organic molecules** and therefore used in refrigerators, air conditioners, in the production of plastic foam, and by the electronic industry for cleaning computer parts, etc. **Hence statement 1 is not correct.**
- **In the stratosphere, they get broken down by powerful UV radiations, releasing chlorine-free radicals.** The chlorine radicals then react with stratospheric ozone to form chlorine monoxide radicals and molecular oxygen. **Hence statement 3 is correct.**
- **In winter, a special type of cloud called polar stratospheric cloud is formed over Antarctica. These polar stratospheric clouds provide a surface on which chlorine nitrate formed gets hydrolyzed to form hypochlorous acid.** It also reacts with hydrogen chloride produced as per reaction (v) to give molecular chlorine. When sunlight returns to Antarctica in the spring, the sun's warmth breaks up the clouds, and HOCl and Cl2 are photolyzed by sunlight. The chlorine radicals thus formed, initiate the chain reaction for ozone depletion. **Hence statement 2 is correct.**

Q 89.B

- Irreparable computers and other electronic goods are known as electronic wastes (e-wastes). E wastes are burried in landfills or incinerated.
- **Dioxins and furans are released during the thermal treatment of Waste Electrical and Electronic Equipment**. Dioxins and furans can enter your body through breathing contaminated air, drinking contaminated water or eating contaminated food. About 90% of exposure to dioxins and furans is from eating contaminated food. Dioxins and furans can build up in the fatty tissues of animals.
- **E-waste-connected health risks may result from direct contact with harmful materials such as lead, cadmium, chromium, brominated flame retardants or polychlorinated biphenyls (PCBs), from inhalation of toxic fumes**, as well as from accumulation of chemicals in soil, water and food. In addition to its hazardous components, being processed, e-waste can give rise to a number of toxic by-products likely to affect human health. Furthermore, recycling activities such as dismantling of electrical equipment may potentially bear an increased risk of injury. **Hence option (b) is the correct answer.**

Q 90.B

- **Context: Scientists studied the structure of liquid carbon for the first time using in situ X-ray diffraction.**
  - **Carbon's liquid state necessitates extreme conditions—temperatures exceeding approximately 4,000 K and pressures of around 100–160 GPa (equivalent to a million atmospheres).** This corresponds to pressures of several hundred megapascals, far above standard laboratory ranges. **Hence, statement 1 is not correct.**
  - **It can be found, for example, in the interior of planets.** It can play an essential role in future technologies like nuclear fusion. **Hence, statement 2 is correct.**

Q 91.B

- **Context: The Department of Posts (DoP) has released a comprehensive policy document outlining the framework for DHRUVA, a national-level Digital Address Digital Public Infrastructure (DPI)**.
- **DHRUVA**
  - **DHRUVA is a DPI being developed by DoP to provide a unique digital address for every home in India. It creates a secure digital environment through which users can share accurate address information by leveraging a geocoded framework.**
  - The DHRUVA envisions a standardised, interoperable, and geocoded digital addressing system that supports secure, consent-based, and seamless sharing of address information. At its core is the concept of Address-as-a-Service (AaaS) — the array of services associated with address data management to support secure and efficient interactions between users, government entities, and private sector organisations.
  - The initiative aims to recognize address information management as a foundational public infrastructure—vital for effective governance, inclusive service delivery, and enhanced user experience. It seeks to build a robust address data sharing and management ecosystem that ensures smooth integration across both public and private sectors. By giving users meaningful control over their address data, the policy promotes user autonomy, drives innovation, and supports ease of living.
  - Furthermore, DHRUVA seeks to foster a collaborative ecosystem in which public and private stakeholders co-create user-centric solutions built on a secure and trusted digital foundation. It aims to catalyze innovation across key sectors—such as governance, e-commerce, logistics, and financial inclusion—through broad-based adoption by ministries, state governments, and other stakeholders.
- **Hence, option (b) is the correct answer**

Q 92.A

- **Context: Six new sites join FAO's Globally Important Agricultural Heritage Systems (GIAHS).**
- **The Globally Important Agricultural Heritage Systems (GIAHS) is a programme initiated by the Food and Agriculture Organization (FAO) of the United Nations.** Launched in 2002 and endorsed as a corporate FAO programme in 2015, its goal is to recognise, support, and safeguard traditional agricultural systems that are rich in agrobiodiversity, resilient, and deeply rooted in local culture and knowledge. **Hence, statement 1 is not correct.**
- **GIAHS encompasses a variety of innovative agricultural systems, including both land-based systems (such as terraced rice paddies, saffron heritage farming) and aquatic-based systems (such as rice–fish culture)**. The FAO's definitions explicitly recognise systems involving freshwater or marine environments, thereby including aquatic heritage systems under GIAHS. **Hence, statement 2 is correct.**
- **India has three GIAHS-designated sites: Hence, statement 3 is not correct.**
  - Pampore Saffron Heritage in Jammu & Kashmir (2011)
  - Koraput Traditional Agriculture in Odisha (2012)
  - Kuttanad Below Sea Level Farming System in Kerala (2013)

Q 93.B

- **Context: CERT-In has issued an advisory on DDoS attack threats to critical sectors after the Pahalgam terror attack. What is a DDoS Attack?**
- **Distributed denial-of-service (DDoS) attack**
  - A distributed denial-of-service (DDoS) attack is a malicious attempt to disrupt the normal traffic of a targeted server, service or network by overwhelming the target or its surrounding infrastructure with a flood of Internet traffic.

- DDoS attacks achieve effectiveness by utilizing multiple compromised computer systems as sources of attack traffic. Exploited machines can include computers and other networked resources such as IoT devices.
- From a high level, a DDoS attack is like an unexpected traffic jam clogging up the highway, preventing regular traffic from arriving at its destination.

- **Hence, option (b) is the correct answer**

Q 94.B

- The Compensatory Afforestation Fund was established under the Compensatory Afforestation Fund Act, 2016, and was enacted to streamline and regulate the compensatory afforestation process in India. **Hence statement 1 is correct.**
- The Act aims to ensure that all forest lands diverted for non-forest purposes (e.g., mining, infrastructure projects) are compensated for through the creation of compensatory afforestation.
- The establishment of the National Compensatory Afforestation Fund (NCAF) is a dedicated fund to receive payments for compensatory afforestation.
- The CAF Act establishes the NCAF under the Public Accounts of India. **Hence statement 2 is correct.**
- The NCAF is a non-lapsable fund that holds all amounts collected as compensatory afforestation from user agencies and other sources. Hence, statement 1 is correct.
- Entities diverting forest land must pay into the NCAF to create compensatory afforestation. Users must prepare plantation plans and achieve targets for compensatory afforestation.
- The Compensatory Afforestation Fund Management and Planning Authority (CAMPA) is an autonomous body responsible for managing the NCAF and planning compensatory afforestation.
- CAMPA is responsible for monitoring and evaluating the progress of compensatory afforestation.
- Penalty for Non-Compliance: Failure to make payments or implement plantation plans can result in penalties.
- The National Compensatory Afforestation Fund (NCAF) receives 10% of the funds collected for compensatory afforestation, and the State Compensatory Afforestation Fund (SCAF) receives the remaining 90% of the funds collected for compensatory afforestation. **Hence statement 3 is not correct.**

Q 95.B

- **Context: The transferable surplus for 2024-25 has been arrived at on the basis of the revised Economic Capital Framework (ECF) as approved by the Central Board of the RBI..**
- The Economic Capital Framework (ECF) is a system used by the Reserve Bank of India (RBI) to determine the appropriate level of risk provisions and surplus distribution to the government. It essentially guides how the RBI manages its capital reserves and decides how much profit it can transfer to the Indian government. The ECF is a risk-based approach, meaning it considers potential risks like credit, operational, and interest rate risks when determining capital needs.
- ECF provides a methodology for determining the appropriate level of risk provisions and profit distribution to be made under Section 47 of the RBI Act, 1934. Therefore, maintaining adequate provisions in the form of Economic Capital is crucial to absorb risks that may arise from any unforeseen events.
- **Components of Economic Capital under ECF:**
  - Realised Equity: This consists of RBI's Capital, Reserve Fund, Contingency Fund (CF), and Asset Development Fund (ADF).
  - Contingent Risk Buffer (CRB): Component of RBI's realized equity to provide for monetary and financial stability, credit, and operational risks.
  - Revaluation Balances: The unrealised gains, net of losses, resulting from exchange rate, gold price and interest rate movements.
  - Tenure of the Framework: The Committee recommended the framework to be reviewed every 5 years.
- **Hence, option (b) is the correct answer**

Q 96.C

- The gradual and fairly predictable change in the species composition of a given area is called ecological succession.
- During succession, some species colonize an area and their population becomes more numerous whereas populations of other species decline and even disappear. The entire sequence of communities that successively change in a given area is called sere(s). The individual transitional communities are termed seral stages or seral communities.

- Ecological succession takes place in two kinds i.e. Primary Succession and Secondary succession.
- Primary succession occurs in essentially lifeless areas and regions (created or exposed for the first time) in which the soil is incapable of sustaining life as a result of such factors as lava flows, newly formed sand dunes, or rocks left from a retreating glacier. The species that invade a bare area are called pioneer species. The pioneer species in secondary succession are plants such as grasses, birch trees, and fireweed. The first organisms to appear in areas of primary succession are often mosses or lichens. These organisms are known as pioneer species because they are the first species present.
- Secondary succession occurs in areas where a community that previously existed has been removed; it is typified by smaller-scale disturbances that do not eliminate all life and nutrients from the environment.
- All succession whether taking place in water or on land, proceeds to a similar climax community the mesic.
- **Species diversity typically increases during the process of ecological succession.**
  - **Early stages may have fewer, hardy species.**
  - **As the environment becomes more hospitable (more nutrients, soil depth, shade, etc.), more complex and varied species colonize the area.**
  - **Thus, diversity increases until a climax community is established.**
- **Hence, option (c) is the correct answer.**

Q 97.B

- Amensalism is a type of biological interaction between two species in which one species is harmed or inhibited, while the other remains unaffected.
  - It is a negative interaction, but only one party is affected negatively.
- The unaffected species does not gain or lose anything from the interaction.
- **Example of Amensalism:**
  - Black walnut tree (Juglans nigra):
    - It releases a chemical called juglone into the soil.
    - This chemical inhibits the growth of nearby plants (especially tomatoes, potatoes, etc.).
    - The walnut tree is not affected, but neighboring plants are negatively impacted.
- **Hence option (b) is the correct answer.**

Q 98.C

- Biodiversity prospecting or bioprospecting is the systematic search for biochemical and genetic information in nature in order to develop commercially valuable products for pharmaceutical, agricultural, cosmetic and other applications. **Hence statement 1 is correct.**
- The illegal collection and patenting of the biological materials originally belonging to some other community, state, or nation; is called bio-piracy. **Hence, statement 2 is correct.**

Q 99.B

- Phytoremediation is an environmentally friendly, cost-effective technique that uses green plants to clean up soil, air, and water contaminated with:
  - Heavy metals (like lead, arsenic, cadmium)
  - Organic pollutants (like petroleum hydrocarbons)
  - Pesticides
  - Radioactive elements
- **Mechanisms of Phytoremediation:**
- There are various types based on how plants deal with the pollutants:
- **Phytoextraction (or Phytoaccumulation):**
  - Plants absorb contaminants (especially heavy metals) and accumulate them in their biomass.
- **Phytodegradation:**
  - Plants break down organic pollutants using enzymes.
- **Phytostabilization:**
  - Plants reduce the mobility of pollutants, preventing their spread.
- **Phytovolatilization:**
  - Plants absorb contaminants and release them into the air in a less toxic form.
- **Rhizofiltration:**
  - Plant roots absorb or adsorb contaminants from polluted water.
- **Hence, option (b) is the correct answer.**

Q 100.C

- **Bioremediation is a branch of biotechnology that employs the use of living organisms in the removal of contaminants,** pollutants, and toxins from soil, water, and other environments. These organisms can include microbes and bacteria.
- **Intrinsic Bioremediation: This converts toxic materials into inert materials by using the native microbiome on the affected area. Hence, option (c) is the correct answer.**
- **Bioaugmentation:** This is the technique of increasing or enhancing the ability of native microbes on the contaminated site to degrade pollutants through the addition of a natural or manufactured population of microorganisms.
- **Biomagnification:** Increase in concentration of a substance in the bodies of consumers as one moves up the food chain is called biomagnification.
- The technique that uses plants to remove, stabilize, or detoxify pollutants is called **phytoremediation.**