Previous Years' Paper

Common University Entrance Test for UG Programmes

CUET-UG - Enviromental Science

Entrance Exam, 2025

(After the list of questions, the solution will Start.)

Q.1. The Ecological Debt Day (Earth shoot day) is calculated as follows:

1. (World Biocapacity/ World Water footprint) x 365

2. (World Biocapacity/ World Carbon footprint) x 365

3. (World Biocapacity/ World Ecological footprint) x 365

4. (World Biocapacity/ World Ecosystem Services) x 365

Q.2. The first Earth Day was celebrated on _____ .

1. 22 April, 1971

2. 22 April, 1972

3. 22 April, 1970

4. 22 April, 1973

Q.3. Which of the following Environmental Ethics includes preservation of wild plants and animals, control of the human population and simple living?

1. Social Ecology

2. Shallow Ecology

3. Deep Ecology

4. Green Ecology

Q.4. Who among the following coined the term of "Oekology"?

1. E. P. Odum

2. Arne Naess

3. A. G. Tansley

4. Ernst Haeckel

Q.5. Diversity of organism which share the same community/habitat and also called as local diversity, is referred to as

1. Beta diversity

2. Gamma diversity

3. Alpha diversity

4. Genetic diversity

Q.6. Match List-I with List-II

List-I	List-II
(Environmental law)	(Year)
(A)The Wildlife (Protection) Act	(I) 1972
(B) The Indian Forest Act	(II) 1927
(C) The Madras Wild Elephant Preservation Act	(III) 1960
(D) The Cruelty Against Animal Act	(IV) 1873

Choose the correctanswer from the options given below:

1. (A) - (I), (B), (II), (C) - (III), (D) - (IV)

2. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)

3. (A) - (I), (B) - (II), (C) - (IV), (D) - (III)

4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Q.7. The theory which states that "the population grows geometrically whereas resources like food grow arithmetically", was given by _____ .

1. Julion Simon

2. Friedrich Engels

3. T. R. Malthus

4. W. Thompson

Q.8. The species that invades a bare area is referred to as _____ .

1. sere(s)

2. pioneer

3. mesic

4. climax

Q.9. Match List-I with List-II

List-I	List-II
Name of Ecosystem	**Name of commonly found producer**
(A) Deserts	(I) Cymbopogon
(B) Grasslands	(II) Capparis
(C) Ponds and Lakes	(III) Hydrilla
(D) Moist deciduous forests	(IV) Tectona

Choose the correct answer from the options given below:

1. (A) - (III), (B) - (II), (C) - (I), (D) - (IV)

2. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

3. (A) - (IV), (B) - (III), (C) - (II), (D) - (I)

4. (A) - (II), (B) - (I), (C) - (III), (D) - (IV)

Q.10. Break down of detritus into smaller particles by earthworm in an ecosystem is referred to as _____ .

1. leaching

2. catabalism

3. fragmentation

4. humification

Q.11. Arrange the following ecological succession in the lithosphere (rocks) from initial to final succession stages

(A) Moss stage

(B) Foliore lichens stage

(C) Herbaceous stage

(D) Crustose-lichens stage

(E) Shrub stage

Choose the correct answer from the options given below:

1. (B), (A), (D), (C), (E)

2. (D), (B), (A), (C), (E)

3. (B), (D), (A), (C), (E)

4. (A), (B), (D), (C), (E)

Q.12. Match List-I with List-II

List-I	List-II
National Park	**State**
(A) Dudhwa	(I) Madhya Pradesh
(B) Kanha	(II) Karnataka
(C) Bandipur	(III) Uttar Pradesh
(D) Kaziranga	(IV) Assam

Choose the correct answer from the options given below:

1. (A) - (IV), (B) - (1), (C) - (III), (D) - (11)

2. (A) - (III), (B) - (I), (C) - (III), (D) - (II)

3. (A) - (11), (B) - (I), (C) - (II), (D) - (IV)

4. (A) - (I), (B) - (III), (C) - (IV), (D) - (II)

Q.13. In which of the following types of population interactions, one species is benefited while another species is being harmed?

(A) Competition

(B) Parasitism

(C) Amensalism

(D) Predation

Choose the correct answer from the options given below:

1. (A), (B) and (D) only

2. (B), (C) and (D) only

3. (B) and (D) only

4. (C) and (D) only

Q.14. Which of the following population growth equation correctly represents the Verhulst-Pearl Logistic growth equation? [Where N =population density at time t; r = intrinsic rate of natural increase; K= carrying capacity]

1. $\frac{dN}{dt} = rN\frac{(N-K)}{K}$
2. $\frac{dN}{dt} = rN\frac{(K-N)}{K}$
3. $\frac{dN}{dt} = rN\frac{(K-N)}{N}$
4. $\frac{dN}{dt} = rN\frac{(N-K)}{N}$

Q.15. Energy flow in an ecosystem is always _____ .

1. Cyclic

2. Multidirectional

3. Bidirectional

4. Unidirectional

Q.16. Which one of the following is a primary air pollutant?

1. Ash from a volcanic eruption

2. Tropospheric Ozone

3. Stratospheric Ozone

4. PAN

Q.17. Most of the agricultural runoff and chemical fertilizers used in farming end up in water bodies, which leads to eutrophication. The nutrients responsible for eutrophication are

1. Nitrogen and Potassium

2. Nitrogen and Phosphorus

3. Phosphorus and Potassium

4. Nitrogen and Boron

Q.18. Which one of the following are the commonly used oxidants in COD (Chemical Oxygen Demand) assays?

1. $K_2Cr_20_7 + HNO_3$

2. $K_2Cr_20_7 + HCL$

3. $K_2Cr_2O_7 + H_2SO_4$

4. $KMNO_4 + HCL$

Q.19. Which one of the following soil types is most suitable for good plant growth and agriculture?

1. Sandy soils

2. Clayey soils

3. Silty soils

4. Loamy soils

Q.20. Which of the following are acid forming precussor gases and causes acid rain?

1. O_3 and SO_2

2. NO_2 and SO_2

3. CO_2 and SO_2

4. NO_2 and NH_3

Q.21. Which of the following diseases is NOT a water-borne disease?

1. Cholera

2. Giardiasis

3. Bronchitis

4. Dracontiasis

Q.22. Which of the following techniques is not appropriate/used for air pollution control?

1. Bag House Filter

2. Cyclone Separator

3. High Volume Sampler

4. Electrostatic Precipitator

Q.23. Match List-I with List-II

List - I	**List-II**
Soil component	**Definition**
(A) Azonal soils	(I) An individual natural aggregate of soil particles.
(B) Regoliths	(II) Organisms living in the soil or ground
(C) Ped	(III) Soils have uniformity from the top-surface to the base, and do not have well-developed soil horizons.
(D) Edaphons	(IV) Zone of loose and unconsolidated weathered rock materials.

Choose the correct answer from the options given below:

1. (A) - (I), (B) – (II), (C) - (III), (D)-(IV)

2. (A) - (IV), (B) - (I), (C) - (II), (D) - (III)

3. (A) - (IV), (B) - (III), (C) - (II), (D) - (I)

4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Q.24. Arrange the following gases in increasing order of their concentrations in the Earth's atmosphere.

(A) Oxygen

(B) Carbon dioxide

(C) Nitrogen

(D) Argon

(E) Neon

Choose the correct answer from the options given below:

1. (B), (E).(D), (A), (C)

2. (E), (D), (B), (A), (C)

3. (C), (A), (D), (B), (E)

4. (E), (B), (D), (A), (C)

Q.25. Match List-I with List-II

List I Content of humus	List II Percentage of contents
(A) Carbon	(I) 35-40%
(B) Oxygen	(II) ~ 5%
(C) Hydrogen	(III) 55-60%
(D) Nitrogen	(IV) 15%

Choose the correctanswer from the options given below:

1. (A) - (III), (B) - (I), (C) - (II), (D) - (IV)

2. (A) - (III), (B) - (II), (C) - (IV), (D) - (I)

3. (A) - (III), (B) - (I), (C) - (IV), (D) - (II)

4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Q.26. In which process, waste material is burnt in absence of oxygen?

1. Incineration

2. Pyrolysis

3. Gasification

4. Composting

Q.27. Catalytic converters fitted in vehicles are used for _____ .

1. oxidation of NOx, CO and hydrocarbons.

2. oxidation of CO and reduction of Nox.

3. reduction of CO_2 and oxidation of NO.

4. oxidation of CO_2 and reduction of NO_2 and volatile organic carbons.

Q.28. Which of the following traditional rainwater harvesting systems is/are commonly used in the state of Bihar?

(A) Eris

(B) Ahar

(C) Surangams

(D) Pyne

Choose the correct answer from the options given below:

1. (B) only

2. (B) and (C) only

3. (A) and (C) only

4. (B) and (D) only

Q.29. Which of the following are associated with Gandhian concepts of holistic development of the nation?

(A) Antodaya

(B) Sarvodaya

(C) Panchayti Raj

(D) Reverse migration

Choose the correct answer from the options given below:

1. (A) and (B) only

2. (A), (B) and (C) only

3. (B) and (C)

4. (A), (B), (C) and (D)

Q.30. Which of the following is a suitable example of sedimentary cycle?

1. Carbon cycle

2. Oxygen cycle

3. Nitrogen cycle

4. Phosphorous cycle

Q.31. Decentralised Waste Water Treatment (DEWAT) system has _____ .

(A) Low primary investment.

(B) Easy to operate and maintenance.

(C) Baffled filter reactor filled with stone for filtration.

(D) First three chambers for sedimentation of sludge.

Choose the correct answer from the options given below:

1. (A), (B) and (D) only

2. (A). (B) and (C) only

3. (A), (B), (C) and (D)

4. (B), (C) and (D) only

Q.32. The resources which are available but are not yet explored due to lack of technology are refreered to as_____ .

1. Reserve resources

2. Potential resources

3. Stock resources

4. Actual resources

Q.33. Who among the following is known as the Father of the Green revolution and was also awarded the Nobel Peace Prize in the year 1970?

1. M. S. Sawaminathan

2. Norman Fukuoka

3. Norman E. Borlaug

4. Borlaugh Fukuoka

Q.34. Organoponics is a labor-intensive form of local agriculture using organic methods. The concept of Organioponics was first evolved in _____ .

1. India

2. Srilanka

3. China

4. Cuba

Q.35. "Sale of products like smartphones interconnected by a network" is a close example of _____

1. positive production externalities

2. neqative consumption externalities

3. positive consumption externalities

4. negative production externalities

Q.36. Arrange the following greenhouse gases in ascending order of their contribution to global warming.

(A) CH_4

(B) N_2O

(C) CFC_S

(D) CO_2

Choose the correct answer from the options given below:

1. (A), (B), (C), (D)

2. (B), (C), (A), (D)

3. (C), (B), (A), (D)

4. (A), (C), (B), (D)

Q.37. Arrange the following electromagnetic radiations in ascending order of their frequency.

(A) Micro-wave

(B) Radio-wave

(C) Gamma Rays

(D) UV Rays

(E) Infrared radiations

Choose the correct answer from the options given below:

1. (A), (B), (C), (D), (E)

2. (C), (D), (A), (B), (E)

3. (B), (A), (E), (D), (C)

4. (D), (C), (B), (A), (E)

Q.38. Which of the following are push factors for rural to urban migration?

(A) Flood

(B) Political instability

(C) Better job opportunities

(D) High agricultural yields

Choose the correct answer from the options given below:

1. (A), (B) and (C) only

2. (B) and (D) only

3. (A) and (B) only

4. (B), (C) and (D) only

Q.39. Ecosystem provides us food, raw materials, genetic resources. This is a close exmaple of _____ .

1. Regulating ecosystem services

2. Supporting ecosystem services

3. Cultural ecosystem services

4. Provisioning ecosystem services

Q.40. Which of the following treaty is known for ban on production and use of ozone depleting substances?

1. Kyoto protocol

2. Montreal protocol

3. Paris agreement

4. Geneva protocol

Read the passage and answer the following questions:

International trade is the result of specialization in production. It benefits the world economy if different countries practice specialization and division of

labor in the production of commodities or provision of services. Each kind of specialization can give rise to trade. Thus, international trade is based on the principle of comparative advantage, complementarity and transferability of goods and services. In principle, international trade should be mutually beneficial to trading partners. In modern times, trade is the basis of the world's economic organization, such as the WTO, and is related to the foreign policy of nations. With well-developed transportation and communication systems, no country is willing to forgo the benefits derived from participation in international trade. There are various factors which can be the basis of international trade, such as differences in national resources, population factors (size and cultural diversity), stage of economic development, extent of foreign investment, transport facilities etc. The world's natural resources are unevenly distributed because of differences in their physical settings i.e., geology, relief, soil and climate. Further, the size, distribution and diversity of people between countries affect the type and volume of goods traded. At different stages of economic development of countries, the nature of items traded undergo changes. Moreover, foreign investment can boost trade in developing countries that lack capital required for the development of mining, oil drilling, heavy engineering and plantation agriculture.

Q.41. Which of the following is NOT an acceptable foundation for international trade?

1. Production of a specific commodity

2. Mutual benefits for trading countries

3. Conflicts in foreign policies of trading countries

4. Better transportation facilities between trading countries

Q.42. Which among the following is a TRUE statement?

1. In agriculturally important countries, agricultural products are expected to be exchanged for manufactured goods.

2. Industrialized nations are expected to import machinery and finished products and export food grains and other raw materials.

3. The countries which are pioneers in the research and development of defense technology are expected to import state-of-the-art defense technology from Third World.

4. The stage of economic development of a country does not impact the nature of traded products.

Q.43. Which of the following is the closest example of internationally traded product due to climatic factors?

1. Export of textiles from Bangaldesh

2. Export of the finest porcelain from Chinal

3. Export of Banana from the tropical regions

4. Export of Batik cloth (a prized handicraft) from Indonesia

Q.44. Which of the following was formerly known as the General Agreement for Tariffs and Trade?

1. World Transportation Organization

2. World Tariffs Organization

3. World Trade Organization

4. World Taxation Organization

Q.45. An initial form of a trade system in primitive societies, where the direct exchange of goods was practiced, is known as _____ .

1. Barabrian System

2. Slave Trade System

3. Barter System

4. Salarium system

Read the passage and answer the following questions:

Agricultural productivity is affected by physical, socioeconomic, institutional and organizational factors, besides the attitude of farmers and their

managerial skills. On the whole, Indian agriculture doesn't show high productivity, though there is an improvement in this sector since independence. Green revolution was introduced in 1967-68, as a new agricultural strategy woven around the usage of high yielding varieties (HYV) of seeds and included inputs such as chemical fertilizers and pesticides, assured water supplies, power supply at subsidized rates, access to credit facilities etc. As a result of Green Revolution, foodgrains production rose sharply. The main beneficiaries of Green revolution programme were Punjab, Haryana and western Uttar Pradesh in terms of wheat production and the deltaic regions of east coast in terms of rice. Ninety percent of the farmers in India are marginal farmer with low land holdings. They practice subsistence farming characterized by uncertain yields, low incomes and low capital formation. Additionally, the excess usage of chemical fertilizers and pesticides have harmed the long term fertility of soil.

Q.46. Which factor is not responsible for low agricultural productivity in India?

1. Lack of credit facilities to the farmers.

2. Reclamation of degraded lands.

3. Uncertain monsoons and lack of irrigational facilities.

4. Smalland noldings Constrin larmmers irom adopuon of mechanized operations.

Q.47. Which of the following is not an advantage of the Green Revolution in India?

1. Use of HYV seeds for cultivation.

2. Introduction of easy credit schemes for the marginal farmers.

3. Use of chemical fertilizers and pesticides.

4. Improvement of irrigation facilities in the dryzone areas.

Q.48. Subsitence farming is not characterised by _____ .

1. uncertainity in the crop yield

2. poor capital gain to farmers

3. dependence on natural resources

4. reliance on modern farming tools and techniques

Q.49. Which one of the following is not a measure to improve agricultural productivity?

1. Speedy implementation of land reforms.

2. Special attention to dryland farming.

3. Propagating scientific agricultural practices.

4. Decreasing cropping intensity.

Q.50. Which of the following state of India was not a direct beneficiary of green revolution in its begining stage in 1970s?

1. Punjab

2. Uttar Pradesh

3. Rajasthan

4. Haryana

Solution

Q.1.

Answer: 3. (World Biocapacity / World Ecological Footprint) × 365

Earth Overshoot Day is the calendar date when humanity's resource use (ecological footprint) exceeds what Earth can regenerate (biocapacity) in that year. Hence, the day number =

$$\frac{\text{World Biocapacity}}{\text{World Ecological Footprint}} \times 365.$$

Q.2.

Answer: 3. 22 April, 1970

The first Earth Day was organized in the United States by Senator Gaylord Nelson and celebrated on **22 April 1970**, marking the start of the modern environmental movement.

Q.3.

Answer: 3. Deep Ecology

Deep ecology advocates the intrinsic value of all living beings, **preservation of wild species**, **reducing human population impact**, and **simple living** to maintain ecological balance.

Q.4.

Answer: 4. Ernst Haeckel

Ernst Haeckel coined the term **"Oecologie/Oekologie"** (ecology) in **1866** to describe the study of organisms' relationships with their environment.

Q.5.

Answer: 3. Alpha diversity

Alpha diversity means **within-habitat (local) species diversity**—the variety and relative abundance of species **at a single site/community**. Beta = between habitats; Gamma = regional; Genetic = within species.

Q.6.

Answer: 3. (A)-(I), (B)-(II), (C)-(IV), (D)-(III)

Matching:

- (A) Wildlife (Protection) Act → 1972
- (B) Indian Forest Act → 1927
- (C) Madras Wild Elephant Preservation Act → 1873
- (D) Cruelty Against Animals (Prevention of Cruelty to Animals) Act → 1960

Q.7.

Answer: 3. T. R. Malthus

Thomas Robert Malthus proposed that **population increases geometrically (exponentially)** while **food supply grows only arithmetically (linearly)**, leading to potential checks like famine and disease.

Q.8.

Answer: 2. Pioneer

The first species to colonize a bare, previously uninhabited area are called **pioneer species**; they initiate succession and modify conditions for later communities.

Q.9.

Answer: 4. (A)-(II), (B)-(I), (C)-(III), (D)-(IV)

- Deserts → **Capparis** (II)
- Grasslands → **Cymbopogon** (I)
- Ponds & Lakes → **Hydrilla** (III)

- Moist deciduous forests → **Tectona (teak)** (IV)

Q.10.

Answer: 3. Fragmentation

In detritus food chain, **earthworms (detritivores)** mechanically break litter into smaller pieces—this is called **fragmentation**. (Leaching = soluble removal; Humification = formation of humus; Catabolism = enzymatic breakdown by microbes.)

Q.11.

Answer: 2. (D), (B), (A), (C), (E)

Lithosere sequence: **Crustose lichens → Foliose lichens → Moss → Herbs/Grasses → Shrubs** (→ Trees). Hence **D → B → A → C → E**.

Q.13.

Answer: A–III, B–I, C–II, D–IV

- **Dudhwa** lies in the Terai of **Uttar Pradesh** near Nepal.
- **Kanha** is a major tiger reserve in **Madhya Pradesh** (home of the hard-ground barasingha).
- **Bandipur** is in the Nilgiri biosphere, **Karnataka**.
- **Kaziranga** sits on the Brahmaputra floodplains of **Assam** (one-horned rhino).

Q.14.

Answer: 1.

$$\frac{dN}{dt} = rN\left(\frac{K-N}{K}\right).$$

None of the four printed options exactly match K−NK $\frac{K-N}{K}$. This appears to be a misprint—the correct form has **(K − N)** in the numerator and **K** in the denominator.

Q.15.

Answer: 4. Unidirectional

Energy enters as sunlight → producers → consumers → decomposers, and much is lost as heat at each step. Unlike nutrients, **energy is not recycled** back to the sun—so the flow is one-way only.

Q.16.

Answer: 1. Ash from a volcanic eruption

Why: It's emitted **directly** into the air (primary pollutant).
Tropospheric ozone and PAN are **secondary** (formed by reactions in air).
Stratospheric ozone isn't a pollutant—it protects from UV.

Q.17.

Answer: 2. Nitrogen and Phosphorus

Why: Excess **nitrates** (N) and **phosphates** (P) from fertilizers wash into lakes/rivers, causing algal blooms → oxygen depletion → fish kills.
Quick tip: *Eutrophication = N + P (think "N-P = No Peace for lakes").*

Q.18.

Answer: 3. $K_2Cr_2O_7 + H_2SO_4$

Standard COD uses **acidic potassium dichromate** (in **sulfuric acid**) as the oxidant (often with Ag_2SO_4 catalyst, $HgSO_4$ to complex chlorides). Nitric or hydrochloric acid aren't used with dichromate for COD.

Q.19.

Answer: 4. Loamy soils

Loam is a balanced mix of sand, silt, and clay—so it holds water and nutrients well **without** getting waterlogged, and still has good aeration and structure. Ideal for roots and most crops.

Q.20.

Answer: 2. NO_2 and SO_2

These gases oxidize in the atmosphere to **HNO_3** and **H_2SO_4**, the main acids in acid rain. (O_3 isn't an acid precursor; CO_2 is weakly acidic but not the cause of acid rain; NH_3 tends to neutralize acids.)

Q.21.

Answer: 3. Bronchitis

Why:

- **Cholera, Giardiasis, Dracontiasis** are all **water-borne** (spread via contaminated water).
- **Bronchitis** is a **respiratory** condition (viral/bacterial/irritants), **not** transmitted through water.

Q.22.

Answer: 3. High Volume Sampler

Baghouse filters, cyclone separators, and electrostatic precipitators **remove** particulates from emissions (control devices). A **High Volume Sampler** is for **monitoring/sampling** ambient particulates, not for controlling pollution.

Q.23.

Answer: 4. (A)–(III), (B)–(IV), (C)–(I), (D)–(II)

- Azonal soils → lack well-developed horizons (III)
- Regoliths → loose, weathered rock material (IV)
- Ped → natural aggregate/clod of soil particles (I)
- Edaphons → soil-dwelling organisms (II)

Q.24.

Answer: 4. (E), (B), (D), (A), (C)

Reason: Typical atmospheric concentrations →
Neon ~0.0018% < CO_2 ~0.04% < Argon ~0.93% < Oxygen ~21% < Nitrogen ~78%.
So increasing order: **Neon (E) < CO_2 (B) < Argon (D) < Oxygen (A) < Nitrogen (C)**.

Q.25.

Answer: 1. (A)–(III), (B)–(I), (C)–(II), (D)–(IV)

- Carbon → **55–60%**
- Oxygen → **35–40%**
- Hydrogen → **~5%**
- Nitrogen → **15% (as per the given options; standard texts often note ~3–6%).**

Q.26.

Answer: Pyrolysis

Pyrolysis is a process in which organic or waste materials are **heated at high temperatures (about 300°C–700°C) in the complete absence of oxygen**. This causes the material to **decompose chemically** into three products — **char (solid), bio-oil (liquid), and gases (like CO and H_2)**. Because no oxygen is present, the material doesn't burn completely; it breaks down instead.

In contrast, **incineration** burns waste in the **presence of oxygen**, **gasification** uses a **limited supply of oxygen**, and **composting** is a **biological decomposition** process that also needs oxygen.

Q.27.

Answer: (2) Oxidation of CO and reduction of Nox

Catalytic converters are emission-control devices used in vehicles to **reduce harmful gases** released from exhaust. They contain catalysts like **platinum (Pt), palladium (Pd)** and **rhodium (Rh)** coated on a ceramic honeycomb structure.

Inside the converter, two main chemical processes occur simultaneously:

- **Oxidation reactions:**
    - **Carbon monoxide (CO)** and **unburnt hydrocarbons (HC)** are oxidized (react with oxygen) to form **carbon dioxide (CO_2)** and **water (H_2O)**.

$$2CO + O_2 \rightarrow 2CO_2$$

$$C_xH_\gamma + (x + \frac{y}{4})O_2 \rightarrow xCO_2 + \frac{y}{2}H_2O$$

Reduction reactions:

- **Nitrogen oxides (NOx)** are reduced (oxygen removed) to form **harmless nitrogen gas (N_2)**.

$$2NO \rightarrow N_2 + O_2$$

Hence, catalytic converters **oxidize CO** and **reduce NOx**, making exhaust gases less polluting.

Q.28.

Answer: (4). (B) and (D) only

Bihar has a well-known traditional water management method called the **Ahar–Pyne system**. It is one of the oldest and most effective indigenous systems of irrigation in eastern India.

- **Ahar:**
  Ahar is a **catchment basin or small reservoir** built in low-lying fields to collect and store rainwater and runoff from nearby rivers or canals.

- **Pyne:**
  Pyne is a **channel or artificial canal** dug to **divert water from rivers or streams** into the Ahar fields.
  The stored water is later used for irrigation during dry periods.

This Ahar–Pyne system ensures **sustainable irrigation and groundwater recharge** in regions where rainfall is uneven.

Q.29.

Answer: (2). (A), (B) and (C) only

Gandhian philosophy focuses on **upliftment of the poorest (Antyodaya)**, **welfare of all (Sarvodaya)**, and **village self-rule (Panchayati Raj)** for true national development.
Reverse migration is not a direct Gandhian concept.

Q.30.

Answer: (4). Phosphorus cycle

The **phosphorus cycle** is a **sedimentary biogeochemical cycle** because phosphorus **moves through rocks, soil, water, and organisms**, but **not through the atmosphere**. Its main reservoir is the **Earth's crust (rocks and sediments)**.

In contrast, **carbon, oxygen, and nitrogen cycles** are **gaseous cycles** since these elements have a major reservoir in the **atmosphere**.

Q.31.

Answer: (3). (A), (B), (C) and (D)

The **DEWAT system** is a **low-cost, decentralized wastewater treatment system** suitable for rural and peri-urban areas. Its features include:

- **Low primary investment** (A)
- **Easy operation and maintenance** (B)
- **Baffled filter reactor (BFR)** filled with stones for filtration (C)
- **Sedimentation chambers** at the start to settle sludge (D)

All four statements correctly describe DEWAT.

Q.32.

Answer: (2) Potential resources

Potential resources are those **found in nature but not yet utilized** because of **lack of technology, knowledge, or means** to extract or use them.

- **Reserve resources** → part of **actual resources** that can be used with current technology.
- **Stock resources** → resources that exist but **cannot be used with current technology**; similar concept, but in geography, potential resources is the standard term.
- **Actual resources** → **currently being used**.

Q.33.

Answer: (3). Norman E. Borlaug

Norman E. Borlaug, an American agronomist, is called the **Father of the Green Revolution** for developing **high-yielding wheat varieties** and modern agricultural techniques that **dramatically increased food production** in the 1960s. He was awarded the **Nobel Peace Prize in 1970** for his contribution to **world food security**.

- **M. S. Swaminathan** → Pioneer of Green Revolution in India, but not the global "father."
- **Norman Fukuoka** → Known for natural farming.

Q.34.

Answer: (4). Cuba

Organoponics is a method of **urban organic agriculture**, mainly using **raised beds, organic compost, and minimal mechanization**. It was **first developed in Cuba** in the 1970s as a response to **food shortages** after the collapse of the Soviet Union, promoting **local, sustainable, and labor-intensive farming** in cities.

- India, Sri Lanka, and China use organic farming, but **Organoponics as a structured urban system originated in Cuba**.

Q.35.

Answer: (3). Positive consumption externalities

When products like **smartphones** are used in a **networked system**, the **benefit of one user increases the benefit for others** (e.g., more people using a messaging app or social network makes it more valuable for everyone).

- This is a **positive effect arising from consumption**, not production.
- **Positive production externalities** → benefit others when producing (like a beekeeper helping nearby crops).
- **Negative externalities** → impose costs on others (pollution, noise, etc.).

Q.36.

Answer: (4). (A), (C), (B), (D)

The **Global Warming Potential (GWP)** of greenhouse gases indicates their contribution to warming:

- **CH_4 (Methane):** Moderate warming potential
- **CFCs:** High GWP (much higher than CO_2 per unit, but lower in overall contribution due to smaller atmospheric concentration)
- **N_2O (Nitrous oxide):** Higher GWP than CH_4 and CO_2
- **CO_2 (Carbon dioxide):** Although its GWP per molecule is lower, its **abundance makes it the largest contributor to global warming overall**

So, in terms of **overall contribution to global warming**, the ascending order is: **$CH_4 < CFCs < N_2O < CO_2$**

Q.37.

Answer: (3). (B), (A), (E), (D), (C)

The **frequency of electromagnetic waves** increases as the wavelength decreases. Typical order from **low frequency to high frequency** is:

- **Radio waves** → lowest frequency
- **Microwaves** → higher than radio waves
- **Infrared (IR) radiation** → higher than microwaves
- **Ultraviolet (UV) rays** → higher than IR
- **Gamma rays** → highest frequency

So, the ascending order of frequency is:
Radio-wave (B) < Microwave (A) < Infrared (E) < UV (D) < Gamma rays (C)

Q.38.

Answer: (3). (A) and (B) only

Push factors are conditions that **force people to leave rural areas** and move to cities, such as:

- **Floods** → damage homes and crops (A)
- **Political instability** → insecurity or conflict (B)

Pull factors, on the other hand, attract people to urban areas:

- **Better job opportunities** (C)
- **High agricultural yields** (D) → indicate prosperity, so they **retain people** rather than push them out

Hence, the correct push factors are **flood and political instability**.

Q.39.

Answer: (4). Provisioning ecosystem services

Provisioning ecosystem services are the **products directly obtained from ecosystems**, such as:

- **Food** (crops, fish, fruits)
- **Raw materials** (wood, fibers)
- **Genetic resources** (for medicine and crop improvement)

Other ecosystem services:

- **Regulating** → control climate, disease, water purification
- **Supporting** → nutrient cycling, soil formation
- **Cultural** → recreational, spiritual benefits

Q.40.

Answer: (2) Montreal Protocol

The **Montreal Protocol (1987)** is an international treaty designed to **phase out the production and consumption of ozone-depleting substances (ODS)** such as **CFCs, halons, and other chemicals** that harm the ozone layer.

Other treaties:

- **Kyoto Protocol** → deals with greenhouse gas emissions and climate change
- **Paris Agreement** → global climate change mitigation and adaptation
- **Geneva Protocol** → bans use of chemical and biological weapons

Q.41.

Answer: (3). Conflicts in foreign policies of trading countries

International trade is based on **comparative advantage, complementarity, and mutual benefits**, supported by production specialization and good transport. **Conflicts in foreign policies** hinder trade, so they are **not a foundation**.

Q.42.

Answer: (1). In agriculturally important countries, agricultural products are expected to be exchanged for manufactured goods.

Countries specialize based on **resources and economic development**. Agricultural nations export food and import manufactured goods. Options 2, 3, and 4 are incorrect because industrialized nations export machinery and manufactured goods, and economic development **does affect trade patterns**.

Q.43.

Answer: (3). Export of Banana from the tropical regions

Climatic conditions determine the **type of agricultural products**. Bananas grow in tropical climates, so **export of bananas is directly influenced by climate**. Other options are based on craftsmanship or industry, not climate.

Q.44.

Answer: (3). World Trade Organization

The **World Trade Organization (WTO)** replaced the **General Agreement on Tariffs and Trade (GATT)** in 1995 to **regulate international trade and tariffs**.

Q.45.

Answer: (3). Barter System

In primitive societies, **goods were exchanged directly without money**. This is called the **barter system**. Other options are unrelated.

Q.46.

Answer: (2). Reclamation of degraded lands

Reclaiming degraded lands **improves productivity**, so it is **not a cause of low productivity**. Other factors like lack of credit, uncertain monsoons, and small landholdings **limit agricultural efficiency**.

Q.47.

Answer: (3). Use of chemical fertilizers and pesticides

While chemical fertilizers and pesticides **increased yields**, their **excessive use harmed soil fertility**, so it is **not considered an advantage**. Other points (HYV seeds, credit schemes, irrigation) were **actual advantages**.

Q.48.

Answer: (4). Reliance on modern farming tools and techniques

Subsistence farming is **traditional and low-tech**, relying on **natural resources**. It does not use modern tools or techniques.

Q.49.

Answer: (4) Decreasing cropping intensity

Increasing cropping intensity improves productivity, not decreasing it. Other measures like land reforms, dryland farming, and scientific practices **help productivity**.

Q.50.

Answer: (3). Rajasthan

The **initial Green Revolution** mainly benefited **Punjab, Haryana, western Uttar Pradesh** (wheat) and **deltaic regions of east coast** (rice). **Rajasthan** was **not a direct beneficiary** in the early stages.