

CUET 2024 Environmental Studies Question Paper (Set-D) with Solutions

Read the following passage and answer the next five questions :

Species interaction and the productivity are two important components of any given ecosystem. In an ecosystem, interspecific interactions arise from the interaction of population of two different species. Such interactions could be beneficial to both species, harmful to both species, beneficial to one and harmful to other or vice-versa. There are also cases that exist where only one species is harmed or benefitted and the other remains unaffected. On the other hand, productivity of an ecosystem starts with photosynthesis by green plants and is measured as amount of biomass produced over a period of time. Such biomass becomes available for consumption to heterotrophs.

Question 1.

Which of the following are correct for the interaction between sea anemone that has stinging tentacles and clownfish?

- (1) Both species are benefitted
- (2) Both are harmed
- (3) One is harmed and the other is benefitted
- (4) One is benefitted and the other remains unaffected

Correct Answer: (1) Both species are benefitted

Solution:

This interaction is a classic example of mutualism where both the clownfish and sea anemone benefit. The clownfish gets protection from predators while the sea anemone gets nutrients from the clownfish's waste.

Quick Tip

Mutualism enhances survival and reproductive success for both interacting species.

Question 2.

The species interaction in which both interacting species are harmed is referred to as:

- (1) Predation
- (2) Parasitism
- (3) Competition
- (4) Mutualism

Correct Answer: (3) Competition

Solution:

Competition occurs when two species compete for the same limited resources, such as food or space, leading to harm for both as neither can optimize resource utilization.

Quick Tip

Competition often limits population growth and resource availability for both species involved.

Question 3.

Mycorrhizal association between fungi and the roots of higher plants is best referred to as:

- (1) Commensalism
- (2) Amensalism
- (3) Mutualism
- (4) Competition

Correct Answer: (3) Mutualism

Solution:

In mycorrhizal associations, fungi improve nutrient and water absorption for the plant, while the plant provides carbohydrates to the fungi, resulting in mutual benefits.

Quick Tip

Mycorrhizal fungi are crucial for plant growth, especially in nutrient-deficient soils.

Question 4.

The available biomass for consumption to herbivores and decomposers is often referred to as:

- (1) Primary production
- (2) Gross primary productivity
- (3) Net primary productivity
- (4) Secondary productivity

Correct Answer: (3) Net primary productivity

Solution:

Net primary productivity (NPP) is the energy remaining in plants after accounting for respiration. It represents the biomass available for consumption by herbivores and decomposers.

Quick Tip

NPP reflects the energy flow from primary producers to higher trophic levels.

Question 5.

Rate of production of organic matter during photosynthesis is referred to as:

- (1) Primary production
- (2) Gross primary productivity
- (3) Net primary productivity
- (4) Standing crop

Correct Answer: (2) Gross primary productivity

Solution:

Gross primary productivity (GPP) is the total organic matter produced by plants during photosynthesis. It includes all energy captured, part of which is used in plant respiration.

Quick Tip

Gross primary productivity is an indicator of the ecosystem's energy capture efficiency.

Question 6.

Match List-I with List-II:

List-I (Author)	List-II (Book/Poem)
(A) Gary Snyder	(I) Mountains and Rivers Without End
(B) Wendell Berry	(II) The Closing Circle
(C) Rachel Carson	(III) Silent Spring
(D) Barry Commoner	(IV) A Place on Earth

Choose the correct answer from the options given below:

- (1) (A) - (IV), (B) - (I), (C) - (III), (D) - (II)
- (2) (A) - (I), (B) - (IV), (C) - (III), (D) - (II)
- (3) (A) - (II), (B) - (IV), (C) - (III), (D) - (I)
- (4) (A) - (IV), (B) - (II), (C) - (III), (D) - (I)

Correct Answer: (2) (A) - (I), (B) - (IV), (C) - (III), (D) - (II)

Solution:

The correct matches are:

- Gary Snyder: Mountains and Rivers Without End
- Wendell Berry: A Place on Earth
- Rachel Carson: Silent Spring
- Barry Commoner: The Closing Circle

Quick Tip

Linking authors to their works helps in understanding their contributions to environmental literature.

Question 7.

Match List-I with List-II:

List-I (Concept)	List-II (Proposed by)
(A) Ecology	(I) Norman Myers
(B) Ecosystem	(II) Ernst Haeckel
(C) Human population growth	(III) Sir Arthur Tansley
(D) Hot spots	(IV) T R Malthus

Choose the correct answer from the options given below:

- (1) (A) - (I), (B) - (IV), (C) - (II), (D) - (III)
- (2) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
- (3) (A) - (II), (B) - (III), (C) - (IV), (D) - (I)
- (4) (A) - (IV), (B) - (I), (C) - (III), (D) - (II)

Correct Answer: (2) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

Solution:

The correct matches are:

- Ecology: Ernst Haeckel
- Ecosystem: Sir Arthur Tansley
- Human population growth: T R Malthus
- Hot spots: Norman Myers

Quick Tip

Understanding historical contributions to ecology aids in answering conceptual questions.

Question 8.

The ecological thought, which believes in saving the forests as trees give oxygen, better rain-

fall, and air quality, and not saving the environment for its true innate values, dominantly belongs to:

- (1) Deep ecology
- (2) Social ecology
- (3) Eco-feminism
- (4) Shallow ecology

Correct Answer: (4) Shallow ecology

Solution:

Shallow ecology focuses on environmental conservation for human benefits, such as improved air quality and water availability, rather than preserving nature for its intrinsic value.

Quick Tip

Shallow ecology emphasizes utilitarian benefits, while deep ecology respects nature's inherent worth.

Question 9.

Which of the following is not a major goal of WWF?

- (1) To conserve world biological diversity
- (2) Sustainable use of renewable natural resources
- (3) Reduction of pollution and wasteful consumption
- (4) Creating worldwide fund for education

Correct Answer: (4) Creating worldwide fund for education

Solution:

WWF focuses on biodiversity conservation, sustainable resource use, and pollution reduction. It does not prioritize creating an education fund as a major goal.

Quick Tip

WWF's efforts are centered on environmental conservation and sustainability, not direct educational funding.

Question 10.

The first Earth Day was celebrated on _____.

- (1) 20 April, 1970
- (2) 22 April, 1970

- (3) 05 June, 1970
- (4) 20 April, 1972

Correct Answer: (2) 22 April, 1970

Solution:

Earth Day was first celebrated on 22 April, 1970, marking the beginning of the global environmental movement to raise awareness about protecting our planet.

Quick Tip

Earth Day is celebrated annually on 22 April to promote environmental awareness and sustainable practices.

Question 11.

The plants and animals that cannot maintain a constant internal environment are called:

- (1) Regulators
- (2) Migraters
- (3) Conformers
- (4) Suspenders

Correct Answer: (3) Conformers

Solution:

Conformers are organisms that rely on external environmental changes to regulate their internal body conditions, unlike regulators that maintain homeostasis.

Quick Tip

Conformers adapt to external conditions, while regulators actively control their internal environment.

Question 12.

The number of individuals of the same species that have come into a habitat from elsewhere during the time period under consideration is referred to as _____.

- (1) Emigration
- (2) Immigration
- (3) Natality
- (4) Mortality

Correct Answer: (2) Immigration

Solution:

Immigration refers to the movement of individuals into a population from other areas, contributing to population growth.

Quick Tip

Immigration increases population size, while emigration reduces it by moving individuals out.

Question 13.

Which of the following statements are correct?

- (A) Species that invade a bare area are called as pioneer species.
- (B) In primary succession on rocks, the pioneers are usually lichens.
- (C) In primary succession in water, the pioneers are reed swamps.
- (D) In secondary succession, species that invade depend on condition of soil, water, and environment.

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

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

Solution:

All the statements are correct:

- Pioneer species invade bare areas.
- Lichens are pioneers in rocky environments.
- Reed swamps pioneer in aquatic succession.
- Secondary succession depends on soil, water, and environmental factors.

Quick Tip

Primary succession begins in lifeless areas with no soil, while secondary succession occurs in previously inhabited areas.

Question 14.

Match List-I with List-II:

List-I (State)	List-II (National Park)
(A) Madhya Pradesh	(I) Namdapha National Park
(B) Arunachal Pradesh	(II) Guindy National Park
(C) Meghalaya	(III) Nokrek National Park
(D) Tamil Nadu	(IV) Kuno National Park

Choose the correct answer from the options given below:

- (1) (A) - (IV), (B) - (I), (C) - (III), (D) - (II)
- (2) (A) - (IV), (B) - (III), (C) - (II), (D) - (I)
- (3) (A) - (IV), (B) - (I), (C) - (II), (D) - (III)
- (4) (A) - (I), (B) - (IV), (C) - (II), (D) - (III)

Correct Answer: (1) (A) - (IV), (B) - (I), (C) - (III), (D) - (II)

Solution:

The correct matches are:

- Madhya Pradesh: Kuno National Park
- Arunachal Pradesh: Namdapha National Park
- Meghalaya: Nokrek National Park
- Tamil Nadu: Guindy National Park

Quick Tip

Associating states with their respective national parks is key for environmental geography questions.

Question 15.

Which of the following soil has high water retention capacity?

- (1) Sandy soil
- (2) Loamy soil
- (3) Sandy silt soil
- (4) Clayey soil

Correct Answer: (4) Clayey soil

Solution:

Clayey soil has the finest particles and very small pore spaces, allowing it to retain a large amount of water for longer durations, making it suitable for crops requiring more water.

Quick Tip

Clayey soil is ideal for water-intensive crops due to its high water-holding capacity.

Question 16.

Which of the following factors can affect the soil respiration process?

- (A) Temperature
- (B) Soil moisture
- (C) Aeration
- (D) Number of soil microbes
- (E) Quality of organic matter in the soil

Choose the correct answer from the options given below:

- (1) (A), (C) and (E) only
- (2) (A), (B), (C) and (D) only
- (3) (B), (C) and (D) only
- (4) (A), (B), (C), (D) and (E)

Correct Answer: (4) (A), (B), (C), (D) and (E)

Solution:

Soil respiration is influenced by:

- Temperature and soil moisture, which affect microbial activity.
- Aeration, which ensures oxygen availability.
- The number of microbes and the quality of organic matter determine the decomposition rate.

Quick Tip

Optimal soil respiration ensures efficient carbon cycling and nutrient availability in ecosystems.

Question 17.

Which of the following is **not** a criteria air pollutant under the National Ambient Air Quality Standards (NAAQS)?

- (1) CO₂
- (2) CO
- (3) O₃
- (4) Pb

Correct Answer: (1) CO₂

Solution:

The NAAQS does not consider CO₂ a criteria air pollutant, as it focuses on pollutants that directly impact human health, like CO, O₃, and Pb.

Quick Tip

NAAQS focuses on pollutants that pose direct health risks, excluding greenhouse gases like CO₂.

Question 18.

The disease "Itai-Itai" is caused by contamination of drinking water with which of the following?

- (1) Mercury
- (2) Cadmium
- (3) Arsenic
- (4) Chromium

Correct Answer: (2) Cadmium

Solution:

"Itai-Itai" disease, first observed in Japan, is caused by cadmium poisoning. It leads to severe bone damage, kidney failure, and other health issues.

Quick Tip

Avoiding industrial pollution in water sources is key to preventing diseases like "Itai-Itai."

Question 19.

Which of the following are essentially required for photochemical smog formation in ambient atmosphere?

- (1) Smoke, water vapour and low temperature (< 25 degree)
- (2) NO_x, SO₂ and high temperature (> 25 degree)
- (3) NO_x, VOCs and high temperature (> 25 degree)
- (4) Smoke, NO_x and low temperature (< 25 degree)

Correct Answer: (3) NO_x, VOCs and high temperature (> 25 degree)

Solution:

Photochemical smog occurs when nitrogen oxides (NO_x) and volatile organic compounds (VOCs) react in the presence of sunlight and high temperatures. This reaction produces harmful ground-level ozone and other pollutants.

Quick Tip

Minimizing VOC and NO_x emissions is crucial to reducing photochemical smog and improving air quality.

Question 20.

Arrange the following stages of primary succession of plants from **last stage to first stage**:

- (A) Reed-swamp stage
- (B) Submerged plant stage
- (C) Marsh Meadow stage
- (D) Phytoplankton

Choose the correct answer from the options given below:

- (1) (A), (B), (C), (D)
- (2) (C), (A), (B), (D)
- (3) (D), (B), (A), (C)
- (4) (A), (C), (B), (D)

Correct Answer: (3) (D), (B), (A), (C)

Solution:

The correct sequence from last stage to first stage is:

- *Phytoplankton* (pioneer stage)
- *Submerged plant stage*
- *Reed-swamp stage*
- *Marsh Meadow stage* (climax vegetation).

Quick Tip

Primary succession follows a predictable path, beginning with pioneer species and culminating in stable, climax vegetation.

Question 21.

Match List-I with List-II:

List-I (Forest Act/Policy)	List-II (Year)
(A) Forest Act	(I) 1927
(B) National Forest Policy	(II) 1988
(C) Forest Conservation Act	(III) 1980
(D) Wildlife Protection Act	(IV) 1972

Choose the correct answer from the options given below:

- (1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
- (2) (A) - (I), (B) - (III), (C) - (I), (D) - (IV)
- (3) (A) - (IV), (B) - (II), (C) - (III), (D) - (I)
- (4) (A) - (III), (B) - (I), (C) - (II), (D) - (IV)

Correct Answer: (1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

Solution:

The correct matches are:

- Forest Act: 1927
- National Forest Policy: 1988
- Forest Conservation Act: 1980
- Wildlife Protection Act: 1972

Quick Tip

Linking laws with their years of implementation is key for questions on environmental legislation.

Question 22.

Arrange the following from lowest to highest dry weight in a biomass pyramid of a grassland ecosystem:

- (A) Primary Producer
- (B) Primary Consumer
- (C) Secondary Consumer
- (D) Tertiary Consumer

Choose the correct answer from the options given below:

- (1) (A), (B), (C), (D)
- (2) (A), (C), (B), (D)
- (3) (D), (C), (B), (A)
- (4) (D), (C), (A), (B)

Correct Answer: (1) (A), (B), (C), (D)

Solution:

In a grassland ecosystem, the biomass pyramid has the following order:

- *Primary Producers* (highest biomass)
- *Primary Consumers*
- *Secondary Consumers*
- *Tertiary Consumers* (lowest biomass).

Quick Tip

Biomass decreases progressively at higher trophic levels due to energy loss in the food chain.

Question 23.

"Curitiba," a city in Brazil, is famously known for its _____.

- (1) organic farming practices
- (2) water network projects implementation
- (3) integrated transport network system
- (4) solid waste disposal system

Correct Answer: (3) integrated transport network system

Solution:

Curitiba is globally recognized for its innovative and efficient integrated transport network system, which includes a pioneering Bus Rapid Transit (BRT) system that reduces traffic congestion and pollution.

Quick Tip

Curitiba's transport model serves as a benchmark for urban mobility and sustainable development.

Question 24.

Which of the following gases give the lowest percentage contribution to total global warming?

- (1) N_2O
- (2) NO_2
- (3) CFCs
- (4) CH_4

Correct Answer: (2) NO₂

Solution:

Among the given gases, NO₂ contributes the least to global warming. While CFCs, CH₄, and N₂O are potent greenhouse gases, NO₂ has a lower impact on global warming.

Quick Tip

Global warming potential (GWP) varies significantly among greenhouse gases; understanding these differences helps in mitigation strategies.

Question 25.

Nomadic movements are not considered as migrations because people move from one place to another _____.

- (1) for economic reasons
- (2) for social factors
- (3) without any intention
- (4) for physical reasons

Correct Answer: (3) without any intention

Solution:

Nomadic movements are temporary and cyclical, driven by resource availability rather than a permanent intention to settle in a new location. This distinguishes them from migrations.

Quick Tip

Migration typically involves permanent relocation, while nomadism is periodic and driven by resource needs.

Question 26.

Which of the following does **not** explain the relationship between human development and economic development?

- (1) Capability expansion through economic growth
- (2) Capability expansion through poverty reduction
- (3) Capability expansion through social services
- (4) Capability expansion through environmental degradation

Correct Answer: (4) Capability expansion through environmental degradation

Solution:

Human development emphasizes sustainable economic growth, poverty reduction, and access to social services. Environmental degradation reduces quality of life and contradicts the goals of human development.

Quick Tip

Sustainability is integral to the link between human and economic development, opposing environmental degradation.

Question 27.

The Gandhian economy model does not contain elements of _____.

- (1) multiplication of needs
- (2) rejection of class-war
- (3) protectionism
- (4) nationalism

Correct Answer: (1) multiplication of needs

Solution:

The Gandhian economy emphasizes simplicity, self-reliance, and minimalism, opposing the multiplication of needs. It advocates for sustainable living and equitable resource use.

Quick Tip

The Gandhian economy prioritizes ethical and sustainable practices, rejecting materialism and excess consumption.

Question 28.

Which of the following method is most suitable for safe disposal of hospital solid waste?

- (1) Dumping
- (2) Incineration
- (3) Pyrolysis
- (4) Composting

Correct Answer: (2) Incineration

Solution:

Incineration is the most effective and suitable method for disposing of hospital solid waste. It destroys pathogens, reduces waste volume, and prevents the spread of infections.

Quick Tip

Proper incineration of hospital waste minimizes health risks and ensures environmental safety.

Question 29.

Arrange the following processes from **start to end** in a food distribution system:

- (A) Packaging of food
- (B) Processing of food
- (C) Storage of food
- (D) Marketing of food

Choose the correct answer from the options given below:

- (1) (A), (B), (C), (D)
- (2) (C), (B), (A), (D)
- (3) (A), (B), (D), (C)
- (4) (C), (B), (D), (A)

Correct Answer: (2) (C), (B), (A), (D)

Solution:

The correct order for a food distribution system is:

- *Storage of food*: Initial step to preserve raw materials.
- *Processing of food*: Converting raw materials into consumable forms.
- *Packaging of food*: Ensuring safety and convenience.
- *Marketing of food*: Distribution and sales to consumers.

Quick Tip

A well-organized food distribution system ensures quality and availability of food to end users.

Question 30.

Which one of the following is an *incorrect* statement in the context of Gross Domestic Product (GDP)?

- (1) GDP does not measure the sustainability of growth.
- (2) GDP helps to understand whether economy is growing or contracting.
- (3) GDP reflects annual trends of inflation and prices of commodities.
- (4) GDP helps to understand shift in the annual changes in the country's economy.

Correct Answer: (3) GDP reflects annual trends of inflation and prices of commodities.

Solution:

GDP measures the economic performance of a country but does not directly reflect trends in inflation or commodity prices, which are tracked by indices like CPI or WPI.

Quick Tip

GDP indicates the total economic output, while inflation trends are analyzed using separate price indices.

Question 31.

Match List-I with List-II:

List-I (Protocol/Convention)	List-II (Year)
(A) Kyoto Protocol	(I) 1987
(B) Montreal Protocol	(II) 1997
(C) Bamako Convention	(III) 1989
(D) Basel Convention	(IV) 1998

Choose the correct answer from the options given below:

- (1) (A) - (IV), (B) - (I), (C) - (II), (D) - (III)
- (2) (A) - (II), (B) - (I), (C) - (III), (D) - (IV)
- (3) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)
- (4) (A) - (II), (B) - (I), (C) - (IV), (D) - (III)

Correct Answer: (2) (A) - (II), (B) - (I), (C) - (III), (D) - (IV)

Solution:

The correct matches are:

- Kyoto Protocol (1997): Focuses on reducing greenhouse gas emissions.
- Montreal Protocol (1987): Aims to protect the ozone layer.
- Bamako Convention (1989): Regulates hazardous waste in Africa.
- Basel Convention (1998): Controls transboundary movements of hazardous waste.

Quick Tip

Understanding the goals and timelines of environmental protocols is crucial for global environmental governance questions.

Question 32.

Petroleum present in sedimentary rocks of a region can only be used when such regions are drilled out and put into use. Such petroleum reserves fall under the category of _____.

- (1) Actual resources
- (2) Potential resources
- (3) Stock resources
- (4) Reserve resources

Correct Answer: (2) Potential resources

Solution:

Potential resources are those that are identified and exist but are not yet utilized due to the lack of technology, accessibility, or cost. Petroleum in sedimentary rocks, waiting to be extracted, falls under this category.

Quick Tip

Potential resources represent untapped reserves, awaiting future exploration or technology for utilization.

Question 33.

Which of the following "water storage" types are commonly used in Bihar?

- (A) Bhundhis
- (B) Ahar
- (C) Kuhls
- (D) Pynes

Choose the correct answer from the options given below:

- (1) (A) and (C) only
- (2) (B) and (D) only
- (3) (A) and (B) only
- (4) (C) and (D) only

Correct Answer: (2) (B) and (D) only

Solution:

Bihar commonly uses *Ahars* and *Pynes*, which are traditional water harvesting systems. *Ahars* are reservoirs, and *Pynes* are channels used for irrigation and water management.

Quick Tip

Indigenous water storage systems like *Ahars* and *Pynes* play a vital role in sustainable water management.

Question 34.

The diversity of organisms that shares the same community/habitat is called as _____.

- (1) Beta diversity
- (2) Gamma diversity
- (3) Alpha diversity
- (4) Genetic diversity

Correct Answer: (3) Alpha diversity

Solution:

Alpha diversity refers to the variety of species within a particular area, community, or ecosystem. It measures species richness and composition within the same habitat.

Quick Tip

Alpha diversity highlights the biodiversity within a specific ecosystem or community.

Question 35.

Which of the following is **not** a basic pillar of sustainable development?

- (1) Environmental preservation
- (2) Social equity
- (3) Economic growth
- (4) Urbanisation

Correct Answer: (4) Urbanisation

Solution:

The three basic pillars of sustainable development are environmental preservation, social equity, and economic growth. Urbanization is not a direct pillar but can influence sustainability if planned appropriately.

Quick Tip

Sustainable development balances environmental, social, and economic goals for long-term progress.

Question 36.

Which of the following is a Kharif crop?

- (1) Wheat
- (2) Rice
- (3) Cucumber
- (4) Mustard

Correct Answer: (2) Rice

Solution:

Kharif crops, like rice, are sown at the beginning of the monsoon season (June-July) and harvested at the end of the rainy season (September-October). Wheat and mustard are Rabi crops.

Quick Tip

Kharif crops depend on monsoon rains, while Rabi crops are cultivated during the winter season.

Question 37.

The concept of Joint Forest Management does **not** include:

- (1) Government works closer with local people to manage forests.
- (2) Locals use forest resources in response to protecting forest ecosystem.
- (3) The infrastructure development at the cost of forest resources.
- (4) Sustainable conservation of forests.

Correct Answer: (3) The infrastructure development at the cost of forest resources.

Solution:

Joint Forest Management (JFM) emphasizes sustainable conservation by involving local communities and the government. It does not support infrastructure development at the cost of forest resources.

Quick Tip

JFM strengthens forest conservation efforts through collaborative community-government approaches.

Question 38.

The ability of the environment to absorb and render removal of harmless waste and pollution is referred to as:

- (1) Source function of ecosystem
- (2) Sink function of ecosystem
- (3) Carrying capacity of ecosystem
- (4) Optimal capacity of ecosystem

Correct Answer: (2) Sink function of ecosystem

Solution:

The sink function of an ecosystem refers to its capacity to absorb, neutralize, or eliminate pollutants and waste without causing harm to the environment or its inhabitants.

Quick Tip

Preserving the sink function of ecosystems is crucial to maintaining environmental health and reducing pollution.

Question 39.

Which of the following is the main characteristic of perpetual resources?

- (1) Consumption at very fast rate
- (2) Continuous availability at limited rate
- (3) Unconditional availability
- (4) Not formed naturally

Correct Answer: (2) Continuous availability at limited rate

Solution:

Perpetual resources, such as solar energy and wind, are continuously available but at a limited rate. They do not deplete with use and are considered inexhaustible.

Quick Tip

Perpetual resources provide a sustainable energy source if utilized efficiently.

Question 40.

Arrange the following radiation in increasing order of their wavelength:

- (A) UV-C
- (B) UV-B

- (C) UV-A
- (D) Infra-red
- (E) Microwave

Choose the correct answer from the options given below:

- (1) (C), (B), (A), (D), (E)
- (2) (A), (B), (C), (E), (D)
- (3) (A), (B), (C), (D), (E)
- (4) (E), (D), (C), (B), (A)

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

Solution:

The correct order of increasing wavelength is:

- UV-C (shortest wavelength)
- UV-B
- UV-A
- Infra-red
- Microwave (longest wavelength).

Quick Tip

Shorter wavelengths correspond to higher energy radiation, while longer wavelengths have lower energy.

Question 41.

A bee-keeper in an orchard enables pollination and fertilization of the orchards' shrubs and trees. This is an example of _____.

- (1) negative production externalities
- (2) negative consumption externalities
- (3) positive production externalities
- (4) positive consumption externalities

Correct Answer: (3) positive production externalities

Solution:

Positive production externalities occur when a producer's activities generate benefits for others. Bee-keeping enhances pollination, leading to increased agricultural yields for orchard owners.

Quick Tip

Positive externalities create additional benefits, fostering mutual advantages in ecosystems and economies.

Question 42.

Arrange the atmospheric layers starting from the Earth's surface upwards:

- (A) Mesosphere
- (B) Stratosphere
- (C) Stratopause
- (D) Mesopause
- (E) Troposphere

Choose the correct answer from the options given below:

- (1) (E), (C), (B), (D), (A)
- (2) (E), (C), (B), (A), (D)
- (3) (E), (B), (C), (A), (D)
- (4) (E), (B), (C), (D), (A)

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

Solution:

The atmospheric layers starting from the Earth's surface are:

- Troposphere (E)
- Stratosphere (B)
- Stratopause (C)
- Mesosphere (A)
- Mesopause (D).

Quick Tip

Each atmospheric layer plays a unique role in Earth's climate and weather systems.

Question 43.

Which of the following is associated with ozone destruction in the stratosphere?

- (A) CFCs
- (B) Polar stratospheric clouds
- (C) UV-B
- (D) UV-A

(E) Cl radicals

Choose the correct answer from the options given below:

- (1) (A) and (E) only
- (2) (A), (B) and (E) only
- (3) (A), (C) and (D) only
- (4) (A), (B), (C) and (E) only

Correct Answer: (2) (A), (B) and (E) only

Solution:

Ozone destruction in the stratosphere is primarily caused by:

- Chlorofluorocarbons (CFCs)
- Polar stratospheric clouds, which facilitate the breakdown of ozone
- Cl radicals, which directly degrade ozone molecules.

Quick Tip

Reducing the use of CFCs is essential to protect the ozone layer and mitigate UV radiation exposure.

Question 44.

Which of the following are examples of resources?

- (A) Materials
- (B) Energy
- (C) Knowledge
- (D) Services

Choose the correct answer from the options given below:

- (1) (A) and (D) only
- (2) (A), (B) and (D) only
- (3) (A), (B) and (C) only
- (4) (A), (B), (C) and (D)

Correct Answer: (4) (A), (B), (C) and (D)

Solution:

Resources include tangible and intangible assets that support economic and social development. Materials, energy, knowledge, and services all contribute to productivity and growth.

Quick Tip

Effective management of both tangible and intangible resources fosters sustainable development.

Question 45.

Which of the following treaty prohibits the import of any hazardous waste (including radioactive waste) into African nations only?

- (1) The Basel Convention
- (2) The Capetown Convention
- (3) The Bamako Convention
- (4) The Madagascar Convention

Correct Answer: (3) The Bamako Convention

Solution:

The Bamako Convention prohibits the import of hazardous waste, including radioactive materials, into African nations. It was established to strengthen waste management in the region.

Quick Tip

The Bamako Convention complements global efforts like the Basel Convention to prevent hazardous waste mismanagement.

Read the following passage and answer the next five questions:

Agricultural runoff, sewage and industrial effluents are major causes of deterioration of water quality in lakes and ponds. Productivity of lakes and ponds (for example, algal bloom and phytoplankton bloom) increases manifold due to agricultural runoff as well as due to excess inputs of nutrients including limiting nutrients, but this continuous increased productivity leads to death of lakes and ponds. The dissolved oxygen, BOD, temperature, turbidity, and salinity are important parameters of water quality in a lake and change naturally on a day and night basis as well as seasonal basis. However, anthropogenic inputs change these parameters abruptly and adversely impact water quality of the lakes. As a result, water in lakes and ponds does not remain fit for human consumption as well as for livestock. Immediate attention and affirmative actions are needed to protect lakes and ponds in our environment.

Question 46.

Continuous increase of productivity of lakes eventually causes:

- (1) Biomagnification in lakes
- (2) Bioaccumulation in lakes
- (3) Eutrophication in lakes
- (4) Bioconcentration in lakes

Correct Answer: (3) Eutrophication in lakes

Solution:

Eutrophication refers to the excessive nutrient enrichment in water bodies, leading to algal blooms. This process depletes oxygen levels, causing the death of aquatic organisms and degradation of the lake ecosystem.

Quick Tip

Controlling agricultural runoff can prevent eutrophication and maintain aquatic ecosystem health.

Question 47.

Dissolved oxygen in water _____.

- (1) remains constant in winter and summer
- (2) remains low in winter and high in summer
- (3) remains high in winter and low in summer
- (4) doesn't depend on temperature of water

Correct Answer: (3) remains high in winter and low in summer

Solution:

Dissolved oxygen levels are inversely proportional to temperature. Cooler temperatures in winter increase oxygen solubility, while warmer summer temperatures decrease it.

Quick Tip

Lower temperatures enhance oxygen solubility, ensuring better dissolved oxygen availability in water bodies.

Question 48.

Excess suspended particles in lake water due to agricultural runoff result in:

- (1) high salinity
- (2) high turbidity
- (3) high dissolved oxygen

(4) high BOD

Correct Answer: (2) high turbidity

Solution:

Agricultural runoff increases the concentration of suspended particles in water, leading to high turbidity. This reduces water clarity and affects aquatic life by limiting light penetration.

Quick Tip

Reducing soil erosion and managing agricultural runoff can significantly reduce turbidity in water bodies.

Question 49.

Water in lakes having very high algal and phytoplankton growth is expected to have:

- (1) high dissolved oxygen.
- (2) high dissolved oxygen and high BOD.
- (3) low dissolved oxygen and high BOD.
- (4) low dissolved oxygen and low BOD.

Correct Answer: (3) low dissolved oxygen and high BOD

Solution:

Excessive algal growth increases the Biological Oxygen Demand (BOD) due to the decomposition of organic matter. This leads to oxygen depletion, resulting in low dissolved oxygen levels in the water.

Quick Tip

Controlling nutrient inflow into lakes helps manage algal blooms and maintain oxygen levels.

Question 50.

Which of the following is a limiting nutrient in lakes and ponds?

- (1) Iron
- (2) Phosphorus
- (3) Magnesium
- (4) Sulphur

Correct Answer: (2) Phosphorus

Solution:

Phosphorus is a critical limiting nutrient in freshwater ecosystems. Its excess, often from fertilizers, leads to eutrophication and rapid algal growth, disturbing the aquatic ecosystem balance.

Quick Tip

Reducing phosphorus inputs from agricultural and urban sources is vital to maintaining healthy aquatic ecosystems.
