*Sustainable development is a balanced approach between Economic development and Environmental conservation.

*Compelling terms for sustainable development are based on the availability of information.

*These information are obtained by Remote sensing technology, Statistical method, Geographical Information System (GIS), Environment information system etc. On the basis of these information, road map of development is prepared.

Figure: Important information for sustainable development

Water & Carbon Cycle in Nature

*Environment includes biotic and abiotic factors. These factors interact with each other. Further, this interaction occurs in a cyclic manner. The flow of energy and matter takes place between these factors (abiotic & biotic) in a cyclic process.

*These cycles exist in nature in the form of Carbon Cycle, Water Cycle etc. *CO_2 is released in the atmosphere by a number of processes, some of them are respiration, volcanic eruptions, combustion of fossil fuels etc. *Autotrophic plants take CO_2 from the atmosphere for synthesizing food.

*It is noteworthy that carbon is found in various forms on the earth. In its elemental state, it is available in the form of coal, graphite and diamond. In compound form, it is found in the form of CO_2, Carbonates and Hydrogen carbonates. Carbon is also recycled by different physical and biological processes.

Figure: Carbon cycle in nature

*Solar radiation plays the most important role in **the water cycle**. Solar radiation initiates water cycle by evaporating water.

***Humidity** is the measure of the moisture content in the air. The measuring device of humidity is **hygrometer** or **psychrometer**.

*The water cycle is driven primarily by the energy from the sun. The solar radiation drives the cycle by evaporating water from the oceans, lakes, rivers and even the soil. It forms water droplets and clouds, where water droplets eventually gain enough mass to fall back to earth. The water cycle is essentially a closed system which means that the volume of water that is in the hydrosphere today is the same amount of water that has always been present in the earth system.

Figure: Water cycle

*Many transplanted seedlings do not grow because most of the root hairs are lost during transplantation. The function of root hairs is to collect water and mineral nutrients present in the soil and take this solution up through the roots to the rest of the plant.

Figure: Imbibition of water from soil (from Less concentration to High concentration)

*These are made up of cellulose and nominal Pectin which helps it as a gelling agent with the soil. Another reason is the use of fertilizers which increases the concentrations of the soil and make it difficult for plants to absorb water. This situation causes desiccation of plant cells causing the leaves to turn brown.

Atmosphere

*The thin layer of gases surrounding the earth is called the atmosphere. The atmosphere is majorly consists of Nitrogen, Oxygen, Carbon dioxide etc. The air around us is a mixture of gases.

Figure: Balance of O_2 and CO_2

*The share of various gases in the composition of air is as follows:

Gas	Percentage
Nitrogen (N_2)	78.08%
Oxygen (O_2)	20.95%
Argon (Ar)	0.93%
Carbon dioxide (Co_2)	0.036%
Neon (Ne)	0.002%
Helium (He)	0.0005%
Krypton	0.001%
Xenon	0.00009%
Hydrogen	0.00005%

*Nitrogen is the most abundant gas available in the environment.

*We need oxygen to survive and therefore we depend on the plants and trees for our survival. Plants and trees go through the process of photosynthesis to prepare food for themselves. In this process, they consume CO_2 present in the atmosphere and release oxygen in the atmosphere.

*The United Nations has identified 17 Sustainable Development Goals which have to be realised by the year 2030. These goals are -

(1) **No Poverty :** End poverty in all its forms everywhere.

(2) **Zero Hunger :** End hunger, achieve food security and improved nutrition and promote sustainable agriculture.

(3) **Good Health and Well Being:** Ensure healthy lives & promote well-being for all at all ages.

(4) **Quality Education:** Ensure inclusive and equitable education and promote lifelong learning opportunities for all.

(5) **Gender Equality:** Achieve gender equality and empower all women and girls.

(6) **Clean Water and Sanitation:** Ensure availability and sustainable management of water and sanitation for all.

(7) **Affordable and Clean Energy:** Ensure access to affordable, reliable, sustainable and modern energy for all.

(8) **Decent Work and Economic Growth:** Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

(9) **Industry, Innovation and Infrastructure:** Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

(10) **Reduced Inequalities:** Reduce inequality within and among countries.

(11) **Sustainable Cities and Communities:** Make Cities and human settlements inclusive, safe resilient and sustainable.

(12) **Responsible Consumption and Production:** Ensure sustainable consumption and production pattern.

(13) **Climate Action:** Take urgent action to combat climate change and its impacts.

(14) **Life Below Water:** Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

(15) **Life on Land:** Combat desertification, sustainably manage forests, half and reverse land degradation and halt biodiversity loss.

(16) **Peace and Justice Strong Institutions:** Promote peaceful and inclusive societies and provide access to justice.

(17) **Partnerships to achieve the Goal:** Global Partnerships for Sustainable Development.

*A Sustainable Development Goal - Index had also been initiated to measure the progress made by various countries in the direction of achieving these goals. **In 2020**, **India** was placed at **117th** position among 166 Countries.

Position of Countries in Sustainable Development Goals (SDG) Index 2020

Sr. No.	Position	Country
1.	1	Sweden
2.	2	Denmark
3.	3	Finland
4.	4	France
5.	5	Germany
6.	6	Norway
7.	7	Austria
8.	8	Czech Republic
9.	9	Netherlands
10.	10	Estonia
11.	111	Gabon
12.	112	Kuwait
13.	113	Iraq
14.	114	Turkmenistan
15.	117	India
16.	134	Pakistan

***Sustainable Farming** is also an important aspect of Sustainable development. *It is notable that UNO declared the year 2003 as the sustainable development year.

*Sustainable agriculture is the production of food, fibre or other plants or other animal products using farming techniques that protect the environment, public health, human communities and animal welfare. In short, it is proper utilization of the land without affecting the environment so that it's quality remains intact.

*Use of chemical fertilizers and pesticides has adversely affected soil health. To cope up with this **National Mission for Sustainable Agriculture (NMSA)** has been formulated for enhancing agricultural productivity, water use efficiency, promoting nutrient management, and Livelihood diversification through the adoption of sustainable development pathways. This mission is a part of the National Action Plan of Climate Change.

***Club of Rome** is an association of economists, civil servants and scientists with a mission to promote understanding of the global challenges facing humanity. This institution Proposes Solutions after scientific analysis, communication and advocacy. The concept of 'Limits to growth' was propounded by the Club of Rome.

Earth Summit (RIO Summit)

*In 1992, more than 100 heads of States met in Rio de Janeiro, Brazil for the first International Earth Summit. This summit was convened to address urgent problems of environmental protection and socio-economic development.

*The Commission on Sustainable Development (CSD) was created to monitor and report on the implementation of the Earth Summit agreement. It was agreed that a five-year review of Earth Summit progress would be made in 1997 at the United Nations General Assembly meeting in special session. Accordingly, a special session of UN General Assembly was held from 23-27 June, 1997 in New York to take stock of how well countries, international organizations and sectors of civil society have responded to the challenges of the Earth Summit. This meeting was known as Earth Summit +5.

***Rio + 10 summit** was held in **Johannesburg** in 2002 and **Rio +20** was held in **Rio de Janeiro** in 2012.

***GEF** provides funds to the least developed countries **"Least Developed Countries Fund" (LDCF)**. It helps in provision & co-ordination for **National Adaptation Programmes of Action (NAPAs)** for these countries.

*It is notable that meeting of **CoP-7** was held at **Marrakesh from 29 October to 10 November 2001**. ***The Special Climate Change Fund (SCCF)** is established by the CoP-7. *This fund helps developing countries in the adaptation as well as transmission of technologies.

***UNDP and UNEP** and **World Bank** are associated with the GEF.

***The Global Environment Facility (GEF)** was established on the eve of the 1992 Rio Earth Summit to help tackle our planet's most pressing environmental problems. Naoko Ishii is presently the Chief Executive Officer and Chairperson of the Global Environment Facility.

Figure: Institutional structure of GEF

*It is a financial mechanism for five major international conventions: the **Minamata Convention** on Mercury, the **Stockholm Convention** on Persistent Organic Pollutants, the **United Nations Convention on Biological Diversity**, the **United Nations Convention to Combat Desertification** and the **United Nations Framework Convention on Climate Change**.

Agenda - 21

***Agenda 21** is a non-binding, voluntarily implemented action plan of the United Nations on Sustainable Development.

Figure: Agenda 21

*It is a product of the Earth Summit (UN Conference on Environment and Development) held in **Rio de Janeiro**, Brazil in 1992.

Figure: Main Features of Agenda 21

RIO + 20 Conference

***Rio+20** is the short name for the United Nations Conference on Sustainable Development. This conference was held in Brazil in June 2012 to mark the **20th anniversary** of the 1992 United Nations Conference on Environment and Development (UNCED), in Rio de Janeiro. The conference's outcome document entitled **'The Future We Want'** was a call to action for governments, businesses and the UN alike to support countries interested in the transition to a green economy. **PAGE** (Partnership for Action on Green Economy) was created as the UN's direct response to this call of action.

Organizations & Institutions

*National and International organizations and institutions are established for environmental conservation and protection.

***National Environmental Engineering Research Institute (NEERI)** is situated in Nagpur, Maharashtra. It was established as **Central Public Health Engineering Research Institute (CPHERI)** in 1958 to focus on water supply, sewage disposal and related diseases and to some extent on industrial pollution.

*NEERI is a pioneering laboratory in the field of environmental science and engineering and part of **Council of Scientific and Industrial Research (CSIR)**.

*NEERI has five zonal laboratories at Chennai, Delhi, Hyderabad, Kolkata & Mumbai. NEERI works under the Ministry of Science & Technology of the Government of India.

***The National Environment Appellate Authority (NEAA)** better known as NEA was set up by the Ministry of Environment and Forest to address cases in which environment clearances were required in certain restricted areas. It was established by the National Environment Appellate Authority Act 1997 to hear appeals with respect to restriction of areas in which any industries, operations or processes shall or shall not be carried out, subject to certain safeguards under the Environment (Protection) Act, 1986.

*The **World Meteorological Organization (WMO)** provides a framework for international cooperation in the development of meteorology and operational hydrology and their practical application. WMO originated from the International Meteorological Organization (IMO) which was founded in 1873 to facilitate the exchange of weather information across national borders. WMO became a specialized agency of the United Nations on 17 March, 1951.

***World Meteorological Convention** was implemented on 23 March, 1950. WMO has its headquarters in Geneva, Switzerland. Its current Secretary-General is **Petteri Taalas** and President is **Gerhard Adrian** of Germany.

***UNEP (United Nations Environment Programme)** was established in 1972. It is headquartered in Nairobi (Kenya). Head of UNEP is **Inger Andersen of Denmark**.

***EPA (Environment Protection Agency)** is an agency of the U.S. It was established on 2 Dec. 1970 for enforcing standards and laws that promote the health of human/individuals and the environment.

***Green Peace International** is a non-governmental organization. *Its headquarter is in Amsterdam, Netherlands.

*NITI **(National Institution for Transforming India)** Aayog is a Nodal Institution for coordination and implementation of Sustainable Development Goals in India.

Acts - Related to Environment Conservation

*Some Acts are passed for promoting conservation of Environment. The **Environment (Protection) Act** was passed in India in 1986. In India, Environment (Protection) Act, 1986 is also known as **Umbrella Legislation**.

*The 1986 Act was passed for the purpose of implementation of decisions that were taken by **United Nations Conference on the Human Environment** held in **Stockholm**.

*Environment (Protection) Act, 1986 was enacted after Bhopal Gas Tragedy under **Article 253** of the Constitution. This Act provides a framework to the Central Government for coordination of the activities of various central and state authorities under various previous laws.

*The Genetic Engineering Approval Committee is constituted under the Environment (Protection) Act, 1986.

*On 22nd July, 2010 Genetic Engineering Approval Committee was renamed as Genetic Engineering Appraisal Committee.

*The **National Green Tribunal** was established on **18 October, 2010** under the National Green Tribunal Act, 2010 for effective and expeditious disposal of cases relating to environmental protection and conservation of forest to provide the right to healthy environment, construed as a part of Right to a Life under **Article 21**.

*Justice **Adarsh Kumar Goel** is the present Chairperson of the National Green Tribunal.

*It was established to solve the problems relating to environmental safety, forest conservation, enforcement of legal rights and to provide compensation to the victim for their property damage.

*This tribunal will help to reduce the number of trials which are pending in high courts. Tribunal is bound to solve applications and petition within one month from the time of their filing.

Environment - Some Important Facts For Exams

*Excess **urbanization** and **industrialization** is a challenge for sustainable development, ecology & environment and biodiversity conservation.

***Green Development** is a book written by **W.M Adams.** *The full name of this Book is **'Green Development: Environment and Sustainability in a Developing World'**. First edition of this book was published in the year1990.

***Masanobu Fukuoka**, the discoverer and innovator of **Natural Farming**, was a Japanese farmer and philosopher.

*Australia launched **Green Army** for environmental Conservation in which 15000 youngsters of age between 17-21 years old will be recruited.

*Under an agreement between **Markfed** of Punjab and **Sayag Group** of Israel on 21 Apr 2001 the vegetables are grown by **Green House farming** in Punjab.

*Mixed cropping, organic manures, nitrogen-fixing plants and pest resistant crop varieties are the best strategy for environment-friendly sustainable development in agriculture.

*The underlying dimension of SDG targets are closely related to education and health aspect as evident in the positive correlation between **HDI** (Human Development Index) and **SDG** rankings of Indian State.

***World Environment Day** is celebrated on **5th June**. The first World Environment Day was celebrated in **1973**.

***Stockholm Summit** was held in 1972. It was the 1st World Summit on Environment. It was decided in this summit that World Environment Day will be celebrated on 5th June every year.

*In 2018 theme of World Environment Day was **'Beat Plastic Pollution'**. India was the global host of 2018 World Environment Day.

*World Environment Day 2019 was hosted by **China** with a theme of **"Air Pollution"**.

*In 2020, theme of World Environment Day is **'Biodiversity'**. This year's host is **Colombia in partnership with Germany**.

*Pakistan will host **World Environment Day 2021**. This year's observance of World Environment Day will be on the theme of '**Ecosystem Restoration**' and focus on resetting our relation with nature.

Basic Questions

1. Given below are two statements, one labelled as Assertion (A) and other as the Reason (R).

Assertion (A) : Sustainable development is important for well being of human society.

Reason (R) : Sustainable development is a kind of development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Codes :

(a) Both (A) and (R) are true and (R) is correct explanation of (A)

(b) Both (A) and (R) are true but (R) is not the correct explanation of (A)

(c) (A) is true but (R) is false

(d) (A) is false but (R) is true

U.P.P.C.S. (Pre) 2019

Ans. (a)

Sustainable development is important for well being of human society. Sustainable development has been defined in many ways. The most frequently quoted definition is from our common future, also known as the Brundtland Report : "Sustainable development is development that meets the needs of the present without compromising the ability of future generation to meet their own needs".

2. Arrange the following events in chronological order and select the correct answer from the codes given below:

I. Rio Earth Summit

II. Publication of Brundtland Commission Report

III. Enforcement of Montreal Protocol

IV. Publication of 'The Limit to Growth' Report

Codes:

(a) I, IV, III, II (b) IV, II, III, I

(c) IV, III, II,I (d) IV, I, III, II

U.P. P.C.S. (Pre) 2020

Ans. (b)

Events	Year
Publication of 'The Limit to Growth' Report	1972
Publication of Brundtland Commission Report	April, 1987
Enforcement of Montreal Protocol	September, 1987
Rio Earth Summit	June, 1992

3. **The discussion on 'Sustainable Development' was started after submitting a report on environment to the United Nations in 1987. That report was:**
   (a) First Report on Climate Change
   (b) Our Common Future
   (c) Second Report on Climate Change
   (d) Fifth Assessment Report

U.P.P.C.S. (Pre) 2020

Ans. (b)

After the submission of the report Our Common Future, also known as the Brundtland Report, which was published by World Commission on Environment and Development (WCED) in 1987, the discussion on 'Sustainable Development' was started.

4. **Environment refers to:**
   (a) The natural world of land, water, air, plants and animals that exist around it.
   (b) The sum total of conditions which surround human beings at a given point of time.
   (c) The interacting system of physical, biological and cultural elements which are interlinked.
   (d) All the above

U.P.P.C.S. (Pre) 2006

Ans. (d)

The word environment is derived from the French word 'Environ' which means to 'encircle or surround'. The environment is a very broad concept and involves everything that affects an organism during its lifetime. It is the totality of all social, biological, physical, and chemical elements individually as well as collectively that compose nature and human-made surroundings. It refers to the total of conditions which surround man at a given point in space and time. The environment is defined as the social, cultural and physical conditions that surround, affect and influence the survival, growth and development of people, animals or plants. As defined in the Environment (Protection) Act, 1986, "environment includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organisms and property. Hence (d) is the correct answer.

5. **Which of the following is not related to environmental protection?**
   (a) Sustainable Development
   (b) Poverty Alleviation
   (c) Air Conditioning
   (d) Use of Paper Bags

U.P.U.D.A./L.D.A. (Pre) 2013

Ans. (b)

Sustainable development and use of paper bags have a positive impact on the environment while air conditioning has a negative impact on the environment as it affects the ozone layer. Poverty alleviation has both positive and negative impact on the environment. Alternatively, poverty is indirectly linked to the environment whereas sustainable development, use of paper bags and air conditioning directly affect the environment. So, if we consider the positive impact on the environment from poverty alleviation, option (c) too may be the correct answer.

6. **The Environment (Protection) Act of India was enacted in–**
   (a) 1981 (b) 1986
   (c) 1995 (d) 2000

U.P.U.D.A./L.D.A. (Pre) 2013

Ans. (b)

The Environment (Protection) Act of India was enacted in the year 1986. It extends to the whole of India.

7. **When the Environment (Protection) Act for preservation and protection of the environment was passed by the Government of India?**
   (a) 1986 (b) 1981
   (c) 1987 (d) 1978

U.P. P.C.S. (Mains) 2017

Ans. (a)

See the explanation of the above question.

8. **In which of the following years the Environment Protection Act was passed?**
   (a) 1982 (b) 1986
   (c) 1990 (d) 1994

U.P.P.C.S. (Pre) 2014

Ans. (b)

See the explanation of the above question.

9. **The 'Environmental Protection Act' in India was enacted in which of the following years?**
   (a) 1980 A.D. (b) 1986 A.D.
   (c) 1992 A.D. (d) 1994 A.D.

U.P.B.E.O. (Pre) 2019

Ans. (b)

See the explanation of the above question.

10. Environment is a composite state of –

(a) Biotic factors (b) Physiographic factors
(c) Abiotic factors (d) All of the above.

53rd to 55th B.P.S.C. (Pre) 2011

Ans. (d)

The environment may be divided into biotic and abiotic environments. The biotic environment is made up of biotic factors, that is all living things in the environment. The abiotic or physical environment is made up of all the physical factors that affect organisms, e.g. temperature, light intensity, the amount of available water etc.

11. Generally, environment can be classified as following categories. Which among the following is NOT a part of such category?

(a) Operational Environment
(b) Physical Environment
(c) Cultural Environment
(d) Biological Environment

U.P.P.C.S. (Pre) 2020

Ans. (a)

Generally, environment can be classified as physical, cultural and biological environment. Physical environment includes landforms, water bodies, climate, soils, rocks, minerals, etc. Biological environment includes plants, animals, microorganisms, etc. whereas cultural environment include man-made features such as economical, social and political elements.

12. Sustainable development is a matter of inter-generational sensibility in respect of the use of?

(a) Natural resources (b) Material resources
(c) Industrial resources (d) Social resources

U.P.P.C.S.(Pre) 2012

Ans. (a)

The concept of sustainable development was emphasized by the United Nations Conference on Environment and Development (UNCED), which defined it as 'Development that meets the need of the present generation without compromising the ability of the future generation to meet their needs. Sustainable development is a matter of inter-generational sensibility in respect of the use of natural resources. The main objective of sustainable development is the just and prudent use of natural resources, it's conservation and proper management. This term was explained in the WCED (World Commission on Environment and Development) report of 1987 titled "Our common future". Sustainable development was fully supported in the Agenda-21 (Rio Declaration) declared in Earth Summit held in 1992. Sustainable development was a prominent issue of the Johannesburg Summit 2002. Notably, the United Nations has identified 17 Sustainable Development Goals (SDGs) which have to be realized by 2030. A Sustainable Development Index has also been initiated to measure the progress made by different nations in the direction of achieving these goals. Importantly India was ranked 117 out of 166 nations in Sustainable Development Index 2020.

Sustainable development Index- 2020

Position/Rank	Country
1	Sweden
2	Denmark
3	Finland
4	France
5	Germany
6	Norway
7	Austria
8	Czech Republic
9	Netherlands
10	Estonia
111	Gabon
112	Kuwait
113	Iraq
114	Turkmenistan
117	India
134	Pakistan

13. 'Saving energy and other resources for the future without sacrificing people's comfort in the present' is the definition of which of the following concepts?

(a) Economic growth
(b) Economic development
(c) Sustainable development
(d) Human development

U.P. P.C.S. (Pre) 2018

Ans. (c)

See the explanation of the above question.

14. Which of the following Sustainable Development Goal (SDG) will target the water availability for all and its permanent management upto 2030 in India?

(a) SDG - 6 (b) SDG - 7
(c) SDG - 8 (d) SDG - 9

U.P.P.C.S. (Pre) 2019

Ans. (a)

The United Nations has identified 17 SDGs (Sustainable Development Goals-SDGs) which have to be realised by the year 2030. Among these goals SDG-6 "Clean Water and Sanitation" ensures availability and sustainable management of water and sanitation for all.

15. The Decade of Sustainable Energy for all is the initiative of:

(a) United Nations (b) India
(c) Germany (d) World Bank

U.P.P.C.S. (Pre) 2017

Ans. (a)

Renewable energy is a form of energy that is not the cause of pollution nor has its adverse effect on natural resources. Sustainable energy is the seventh goal of the 17 UN Sustainable Development Goals (SDGs), with a call to ensure access to affordable, reliable, sustainable and modern energy for all by 2030. The Sustainable Energy for all initiative, acts in support of the 2014-2024 decade of Sustainable Energy for All as declared by the UN General Assembly.

16. Which of the following is a Nodal Institution for implementation of Sustainable Development Goals in India?

(a) Planning Commission
(b) Disinvestment Commission
(c) NITI Aayog
(d) Finance Commission

U.P.P.C.S. (Pre) 2019

Ans. (c)

NITI (National Institution for Transforming India) Aayog is a Nodal Institution for coordination and implementation of Sustainable Development Goals in India.

17. World Environment Day is celebrated on:

(a) 21 March (b) 23 September
(c) 5 June (d) 25 May

Jharkhand P.C.S. (Pre) 2013
Uttarakhand Lower (Sub.) (Pre) 2010

Ans. (c)

World Environment Day is celebrated on 5 June every year. China was the global host of 2019 World Environment Day with "Air Pollution" as the theme of that year's edition. In 2020, theme of World Environment Day was 'Biodiversity'.

18. The World Environment Day is celebrated on –

(a) December 1
(b) June 5
(c) November 14
(d) August 15

U.P.P.C.S. (Mains) 2014
U.P.P.C.S.(Pre) 2012
U.P.P.C.S. (Mains) 2011
Uttarakhand U.D.A./L.D.A (Pre) 2007
Uttarakhand P.C.S. (Pre) 2006
U.P.P.C.S. (Mains) 2004

Ans. (b)

See the explanation of the above question.

19. The book 'Silent Spring' published in 1962 which set the tone for an environmental movement in the world, was written by:

(a) Carolyn Merchant
(b) Karl Marx
(c) Rachel Carson
(d) Rajgopalan

U.P.P.C.S. (Pre) 2020

Ans. (c)

'Silent Spring' is an environmental science book published in 1962. It was written by an American biologist and ecologist 'Rachel Carson'.

20. A country's natural capital included all of the following except:

(a) Forest (b) Water
(c) Roads (d) Minerals

U.P.P.C.S.(Pre) 2012

Ans. (c)

'Natural capital includes all renewable and non-renewable environmental resources. It includes air, water, land, minerals and forests. In other words only those resources, which are created by nature, without any human interference, can be deemed as natural capital. Hence, roads cannot be included in the country's natural capital.

Figure: Different types of Natural Resources

21. What is the theme for 'World Environment Day 2018'?

(a) Connecting People to Nature
(b) One World, Our Environment
(c) Beat Plastic Pollution
(d) Save Water for Future

U.P. R.O./A.R.O. (Pre) 2017

Ans. (c)

India was the global host of 2018 World Environment Day (5 June). The theme of that year's edition was 'Beat Plastic Pollution'. China was the global host of 2019 'World Environment Day'. The theme for 2019 was 'Air Pollution'. In 2020, theme of World Environment Day was 'Biodiversity'.

22. The main role of solar radiation is in –

(a) Carbon cycle (b) Hydrogen cycle
(c) Water cycle (d) Nitrogen cycle

U.P. Lower Sub. (Spl.) (Pre) 2004
U.P.P.C.S. (Pre) 2000

Ans. (c)

The water cycle is driven primarily by the energy from the sun. This solar radiation drives the cycle by evaporating water from the oceans, lakes, rivers and even the soil. It forms water vapour and clouds, where water droplets eventually gain enough mass to fall back to earth. The water cycle is essentially a closed system, meaning that the volume of water that is in the hydrosphere today is the same amount of water that has always been present in the earth system.

23. National Environmental Engineering Research Institute is situated at:

(a) Bangaluru (b) Hyderabad
(c) Nagpur (d) New Delhi

U.P.P.C.S. (Pre) 2014
U.P.P.C.S. (Pre) 2012
U.P.P.C.S (Mains) 2011
Uttarakhand P.C.S. (Pre) 2010
U.P.P.C.S (Mains) 2005
U.P. Lower Sub. (Pre) 2004

Ans. (c)

The National Environmental Engineering Research Institute (NEERI) is a research institute created and funded by the Government of India. It was established in Nagpur in 1958 as Central Public Health Engineering Research Institute (CPHERI) with focus on water supply, sewage disposal and related diseases and to some extent on control of industrial pollution. NEERI is a pioneering laboratory in the field of environmental science and engineering and part of the Council of Scientific and Industrial Research (CSIR). NEERI has five zonal laboratories at Chennai, Delhi, Hyderabad, Kolkata and Mumbai. NEERI falls under the Ministry of Science and Technology, Government of India.

24. When and where the National Environment Engineering Research Institute (NEERI) was established?

(a) 1970, Dhanbad (b) 1958, Nagpur
(c) 1956 ,New Delhi (d) 1960, Chennai

U.P. P.C.S. (Mains) 2017

Ans. (b)

See the explanation of the above question.

25. What is important for Sustainable Development?

(a) Conservation of biological diversity
(b) Prevention and Control of Pollution
(c) Decreasing poverty
(d) All of these.

U.P. Lower Sub. (Pre) 2004

Ans. (d)

Conservation of biological diversity, prevention and control of pollution, decreasing poverty, all are important for Sustainable Development. It is imperative for achieving the goal of sustainable development to make policies on information about our environment and ecology. Presently sustainable development has become an alternative approach

to the theories of development. Certain information are required for policy formulation on sustainable development.

26. Which one of the following is not the objective of smart city development?

(a) Good governance
(b) Clean green city
(c) Stabilizing quality of life
(d) Smart mobility

U.P. P.C.S. (Mains) 2017

Ans. (c)

The Smart City Mission is an innovative and new initiative by the Government of India to drive economic growth and improve the quality of life of people by enabling local development and harnessing technology as a means to create smart outcomes for citizens.
The core infrastructure elements of the mission are-

* Adequate water supply.
* Assured electricity supply.
* Sanitation including solid waste management.
* Efficient urban mobility and public transport.
* Affordable housing, especially for the poor.
* Robust IT connectivity and digitalization.
* Good Governance, especially e-Governance and people's participation.
* Sustainable environment.
* Safety and security of citizens, particularly women, children and the elderly.
* Health and Education.

27. 'Earth Summit' was held at:

(a) Cairo (b) Rio-de-Janeiro
(c) Durban (d) Kyoto

Uttarakhand U.D.A./L.D.A. (Pre) 2003

Ans. (b)

The first Earth Summit by United Nations Conference on Sustainable Development was held in Rio-de-Janeiro. In 2012, the United Nations Conference on Sustainable Development was also held in Rio and is also commonly called Rio+20 or Rio Earth Summit 2012.

28. What was the title of the Rio -20 declaration?

(a) The future we want (b) The future we seek
(c) The future we have (d) The future we see
(e) None of these

Chhattisgarh P.C.S. (Pre) 2015

Ans. (a)

The United Nations Conference on Sustainable Development (UNCSD) also known as Rio 2012, Rio+20 or Earth Summit 2012 was the third international conference on sustainable development hosted by Brazil in Rio-de-Janeiro. The primary result of the conference was the non-binding document " The future we want" a 49-page action plan.

29. The first 'Earth Summit' was held at-

(a) Washington (b) Geneva
(c) Rio-de-Janeiro (d) Buenos Aires

M.P.P.C.S. (Pre), 1998

Ans. (c)

See the explanation of the above question.

30. International Conference held in Rio-de-Janeiro was:

(a) United Nations Conference on Sustainable Development
(b) Environment and Pollution Summit
(c) International new Economics
(d) None of these

M.P.P.C.S. (Pre) 1992

Ans. (a)

International conference held in Rio-de-Janeiro in 1992 was the United Nations Conference on Sustainable Development.

31. What is the thin layer of gases around the earth called?

(a) Biosphere (b) Water particle
(c) Atmosphere (d) Hydrosphere

44th B.P.S.C. (Pre) 2000

Ans. (c)

The thin layer of gases surrounding the earth is called the atmosphere. The majority of the Earth's atmosphere consists of a high amount of nitrogen, along with smaller amounts of oxygen and carbon dioxide.

32. Air is a/an:

(a) Compound (b) Element
(c) Mixture (d) Electrolyte

39th B.P.S.C. (Pre) 1994

Ans. (c)

Air is a mixture of gases. By volume, about 78% of this mixture is nitrogen and about 21% is oxygen. Carbon dioxide, argon, methane, ozone and water vapour are also present in very small quantities.

33. Percentage of Nitrogen in dry air –

(a) 21% (b) 27%

(c) 50% (d) 78%

M.P.P.C.S. (Pre) 1990

Ans. (d)

The air around us is a mixture of gases, mainly nitrogen and oxygen, but containing much smaller amounts of water vapour, argon, and carbon dioxide and very small amounts of other gases.

Gas	Percentage
Nitrogen (N_2)	78.08%
Oxygen (O_2)	20.95%
Argon (Ar)	0.93%
Carbon dioxide (CO_2)	0.036%
Neon (Ne)	0.002%
Helium (He)	0.0005%
Krypton	0.001%
Xenon	0.00009%
Hydrogen	0.00005%

34. Which of the following is considered to be the optimum concentration of carbon-dioxide for natural balance in atmosphere?

(a) 0.02 percent (b) 0.03 percent

(c) 0.04 percent (d) 0.05 percent

U.P.P.C.S. (Pre) 2017

Ans. (b)

See the explanation of the above question.

35. Which one of the following Noble Gases is not present in the air?

(a) Helium (b) Argon

(c) Radon (d) Neon

U.P.P.C.S. (Pre) 2005

Ans. (c)

See the explanation of the above question.

36. In the atmosphere, the highest percentage is of:

(a) Oxygen (b) Carbon dioxide

(c) Nitrogen (d) Hydrogen

Uttrakhand U.D.A./LDA (Mains) 2007

Ans. (c)

See the explanation of the above question.

37. The highest percentage of gas in the air is –

(a) Hydrogen (b) Carbon dioxide

(c) Oxygen (d) Nitrogen

41st B.P.S.C. (Pre) 1996

Ans. (d)

See the explanation of the above question.

38. If all the plants and trees vanish from the earth, the gas which will decrease is –

(a) Carbon dioxide (b) Nitrogen

(c) Water vapour (d) Oxygen

R.A.S./R.T.S.(Pre) 2012

Ans. (d)

We need oxygen to survive and we depend on trees to provide this oxygen. To make food for themselves, trees go through a process known as photosynthesis where they take in carbon dioxide from the air and release oxygen back into the atmosphere. Hence option (d) is the correct answer.

39. Which of the following is not a function of the tree?

(a) Absorption of carbon dioxide

(b) Absorption of noise

(c) Air pollution

(d) Releasing oxygen

R.A.S./R.T.S. (Pre) 1993

Ans. (c)

Trees contribute to the environment by providing oxygen, improving air quality, climate amelioration, conserving water, preserving soil and supporting wildlife. Hence they clean the environment and are not the reason behind air pollution. In addition to this, trees on both sides of roads reduce the sound pollution by reducing the intensity of sound by 10 to 15 decibels.

40. Consider the following :

1. Photosynthesis 2. Respiration

3. Decay of organic matter 4. Volcanic action

Which of the above add carbon dioxide to the carbon cycle on Earth?

(a) 1 and 4 (b) 2 and 3

(c) 2, 3 and 4 (d) 1, 2, 3 and 4

I.A.S (Pre) 2014

I.A.S. (Pre) 2011

Ans. (c)

The decay of organic matter, volcanic action, respiration and burning of fossil fuel etc contribute carbon dioxide to the carbon cycle, whereas plants use carbon dioxide in the process of photosynthesis. Thus plants do not add carbon dioxide to the carbon cycle rather they release oxygen and consume carbon dioxide. Three natural allotropes of carbon are – amorphous, graphite and diamond. Besides, as a compound, it is found as carbon dioxide, carbonate and Hydrogen carbonate.

41. Which of the following does not add the carbon dioxide to carbon cycle on the planet Earth?

(a) Respiration
(b) Photosynthesis
(c) Decay of organic matter
(d) Volcanic action

U.P.P.C.S. (Mains) 2012

Ans. (b)

See the explanation of the above question.

42. The concept of weathering relates to –

(a) Deposition of decomposed material
(b) Change in weather conditions day to day
(c) Natural process leading to the decomposition of rocks
(d) None of the above

Uttarakhand P.C.S. (Pre) 2006

Ans. (c)

Weathering is defined as mechanical disintegration and chemical decomposition of rocks through the actions of various elements of weather and climate. Weathering processes are conditioned by many complex geological, climatic, topographic and vegetative factors.

43. The Headquarter of World Meteorological Organization is located at –

(a) Geneva (b) Rome
(c) Sidney (d) Tokyo

U.P.P.C.S. (Mains) 2010

Ans. (a)

The World Meteorological Organization (WMO) provides a framework for international cooperation in the development of meteorology and operational hydrology and their practical application. WMO originated from the International Meteorological Organization (IMO) which was founded in 1873 to facilitate the exchange of weather information across national borders. WMO became a specialized agency of the United Nations on 17 March, 1951. Notably, World Meteorological Convention was implemented on 23 March, 1950. It has its headquarter in Geneva, Switzerland.

44. The headquarter of U.N.E.P. is located at –

(a) Geneva (b) Kathmandu
(c) Nairobi (d) New Delhi

U.P.P.C.S. (Mains) 2010
U.P.P.S.C. (GIC) 2010

Ans. (c)

UNEP (United Nations Environment Programme) was established in 1972. Its headquarter is in Nairobi (Kenya). Inger Andersen of Denmark is currently the Executive Director of the United Nations Environment Programme.

45. Where is the headquarter of the United Nations Environment Programme (UNEP)?

(a) The Hague (b) Nairobi
(c) New York (d) Washington D.C.

Jharkhand P.C.S. (Pre) 2016

Ans. (b)

See the explanation of the above question.

46. Where was the 4th session of the UN Environment Assembly (UNEA-4) held recently?

(a) Paris-France (b) Ulaanbaatar-Mongolia
(c) Beijing - China (d) Nairobi-Kenya
(e) None of the above/More than one of the above

65th B.P.S.C. (Pre) 2019

Ans. (d)

The fourth session of the United Nations Environment Assembly (UNEA-4) took place from 11-15 March 2019 in Nairobi, Kenya. The theme of UNEA-4 was "Innovative solutions for environmental challenges and sustainable consumption and production". It is noteworthy that the fifth session of UNEA take place in Nairobi in February 2021, under the theme, " Strengthening Actions for Nature to Achieve the Sustainable Development Goals".

47. What does EPA stand for –

(a) Environment Pollution Agency
(b) Environmental Prohibition Agency
(c) Environment Protection Agency
(d) None of these

Uttarakhand U.D.A./L.D.A. (Pre) 2003

Ans. (c)

Environment Protection Agency (EPA) is an agency of the Federal Government of the United States which was created for the purpose of protecting human health and the environment by writing and enforcing regulations based on laws passed by the Congress. It was established on 2 December 1970.

48. In which of the following institutes, the Environmental Information System (ENVIS)'s 'Centre on Population and Environment' is located?

(a) I.I.T. Kharagpur
(b) I.I.T. New Delhi
(c) I.I.P.S. Mumbai
(d) N.I.R.S. Dehradun

U.P. P.C.S. (Mains) 2017

Ans. (c)

The Environmental Information System (ENVIS)'s 'Centre on Population and Environment' is located in International Institute for Population Sciences (IIPS), Mumbai.

49. N.E.A. Stands for:

(a) National Enquiry Act
(b) National Environment Authority
(c) National Examination Agency
(d) National Event Association

Chhattisgarh P.C.S. (Pre) 2003

Ans. (b)

The National Environment Appellate Authority (NEAA) better known as NEA was set up by the Ministry of Environment and Forest to address cases in which environment clearances were required in certain restricted areas. It was established by the National Environment Appellate Authority Act 1997 to hear appeals with respect to restriction of areas in which any industries, operations or processes shall or shall not be carried out, subject to certain safeguards under the Environment (Protection) Act, 1986. On the establishment of National Green Tribunal on 18th October, 2010, under National Green Tribunal Act, 2010, the NEAA stands dissolved.

50. The headquarters of the Green Peace International is located at –

(a) Amsterdam (b) Canberra
(c) Ottawa (d) Nagasaki

U.P.P.C.S. (Mains) 2005

Ans. (a)

Greenpeace is a non-governmental environmental organization with offices in over 55 countries. It is headquartered in Amsterdam, Netherlands. Greenpeace states its goal is to "ensure the ability of the Earth to nurture life in all its diversity".

51. Eco-Mark is given to an Indian product which is –

(a) Pure and unadulterated (b) Rich in protein
(c) Environment-friendly (d) Economically viable

U.P.P.C.S. (Pre) 2012

Ans. (c)

Eco-mark is a certification mark issued by the Bureau of Indian Standards (The National Standards Organization of India) to products conforming to a set of standards aimed at ensuring the least impact on the ecosystem. The marking scheme was started in 1991.

52. To label environment-friendly consumer products, the Government has introduced:

(a) Agmark (b) Eco mark
(c) ISI Mark (d) Watermark

U.P.P.C.S. (Spl) (Mains) 2004

Ans. (b)

See the explanation of the above question.

53. According to 'Sustainable Development Goal (SDG) India Index, 2019' recently released by NITI Aayog, which State holds the first position?

(a) Uttar Pradesh (b) Bihar
(c) Jharkhand (d) Kerala

U.P.B.E.O. (Pre) 2019

Ans. (d)

SDG (Sustainable Development Goal) India Index 2019-20, released by NITI Aayog, was launched on December 30th, 2019. Kerala achieved the first rank in the Index with a score of 70 followed by Himachal Pradesh (69). Andhra Pradesh, Telangana and Tamil Nadu were ranked at the third position with the score of 67.

54. Which of the following states is NOT in the list of top five states on the Sustainable Development Goals Index, 2019-20 India?

(a) Gujarat (b) Himachal Pradesh
(c) Andhra Pradesh (d) Tamil Nadu

U.P.B.E.O. (Pre) 2019

Ans. (a)

See the explanation of the above question.

55. Sustainable agriculture means:

(a) Self-sufficiency

(b) To be able to export and import under WTO norms

(c) To utilize land so that its quality remains intact

(d) To utilize Wasteland for agricultural purposes

U.P.P.C.S.(Pre) 2001

Ans. (c)

Sustainable agriculture is the production of food, fibre or other plants or other animal products using farming techniques that protect the environment, public health, human communities and animal welfare. In short, it is proper utilization of the land without affecting the environment so that it's quality remain intact. Use of chemical fertilizers and pesticides has adversely affected soil health. To cope up with this, National Mission for Sustainable Agriculture (NMSA) has been formulated for enhancing agricultural productivity, water use efficiency, promoting nutrient management, and livelihood diversification through the adoption of sustainable development pathways.

56. Which one of the following States in India has recently introduced the 'Greenhouse Farming':

(a) Haryana (b) Punjab

(c) Maharashtra (d) Uttar Pradesh

U.P.P.C.S.(Pre) 2003

U.P.P.C.S.(Pre) 2001

Ans. (b)

Markfed of Punjab and Sayag Group of Israel signed an agreement to grow vegetables in Greenhouses Farming on 21 April, 2001.

57. Given below are two statements –

Assertion (A) : Natural vegetation is the true index of climate.

Reason (R) : Water-loving plants are found in a moist climate.

In the context of the above, which one of the following is correct?

Codes :

(a) Both statements are true and (R) is the correct explanation of (A).

(b) Both statements are true but (R) is not the correct explanation of (A).

(c) (A) is true, but (R) is false.

(d) (A) is false, but (R) is true.

U.P.P.C.S. (Pre) 2009

Ans. (a)

Natural vegetation is the true index of climate and an increase in the quantity of carbon dioxide in the atmosphere also affects the natural vegetation. Water-loving or Aquatic plants are those which are found mostly in muddy land and near the ponds. They are found in the moist climate. Reduction of moisture in the atmosphere results in the erosion of such plants. Hence both Assertion (A) and Reason (R) are correct and Reason (R) is the correct explanation of Assertion (A).

58. Urbanization and industrialization are harmful-

(a) For balanced development

(b) Environment and ecology

(c) For biodiversity conservation

(d) For all the above.

U.P.P.C.S. (Mains) 2002

Ans. (d)

Extreme urbanization and industrialization are harmful to balanced development, environment and ecology and biodiversity conservation. Thus option (d) is the correct answer.

High-Level Questions

1. The National Green Tribunal Act, 2010 was enacted in consonance with which of the following provisions of the Constitution of India?

1. Right to a healthy environment, construed as a part of Right to Life under Article 21.

2. Provision of grants for raising the level of administration in the Scheduled Areas for the welfare of Scheduled Tribes under Article 275(1).

3. Powers and functions of Gram Sabha as mentioned under Article 243(A).

Select the correct answer using the codes given below:

(a) Only 1 (b) 2 and 3

(c) 1 and 3 (d) 1, 2 and 3

I.A.S. (Pre) 2012

Ans. (a)

The National Green Tribunal was established on 18 October, 2010 under the National Green Tribunal Act, 2010 for effective and expeditious disposal of cases relating to environmental protection and conservation of forest to provide the right to a healthy environment, construed as a part of Right to Life under Article 21. Justice Adarsh Kumar Goel is the present Chairperson of the National Green Tribunal. Hence (a) is the correct answer.

2. The National Green Tribunal (NGT) came into force in:

(a) October, 2010 (b) November, 2008
(c) January, 2011 (d) April, 2012

U.P. P.C.S. (Mains) 2017

Ans. (a)

See the explanation of the above question.

3. National Green Tribunal (NGT) was established by the Government of India in:

(a) 2008 (b) 2009
(c) 2010 (d) 2011

Jharkhand P.C.S. (Pre) 2016

Ans. (c)

See the explanation of the above question.

4. The author of 'Green Development' is –

(a) M.J. Bradshaw (b) M. Nicolson
(c) R.H. Whittaker (d) W.M. Adams

U.P.P.C.S (Pre) 2011

Ans. (d)

William M. Adams is the author of the book Green Development: Environment and Sustainability in a Developing World. Its first edition was published in 1990.

5. What is Rio+20 Conference, often mentioned in the news?

(a) It is the United Nations Conference on Sustainable Development.
(b) It is a Ministerial Meeting of the World Trade Organization.
(c) It is a Conference of the Inter governmental Panel on Climate Change.
(d) It is a Conference of the Member Countries of the Convention on Biological Diversity.

I.A.S. (Pre) 2015

Ans. (a)

Rio+20 is the short name for the United Nations Conference on Sustainable Development. This conference took place in Brazil in June 2012 to mark the 20th anniversary of the 1992 United Nations Conference on Environment and Development (UNCED), in Rio-de-Janeiro, and the 10th anniversary of the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg.

6. In the year 1997, the World Environment Conference was organised in?

(a) Reo-de-Janeiro (b) Nairobi
(c) Kyoto (d) New York

Uttarakhand P.C.S. (Pre) 2016

Ans. (c)

In the year 1997, the World Environment Conference was organised in Kyoto, Japan. The Kyoto Protocol to the United Nations Framework Convention on Climate Change was adopted in this conference which came into existence on 16 February, 2005.

7. The Earth Summit + 5 was held in?

(a) 2005 (b) 2000
(c) 1999 (d) 1997

U.P.P.C.S. (Mains) 2016

Ans. (d)

In 1992, more than 100 heads of states met in Rio-de-Janeiro, Brazil for the first International Earth Summit. This summit was convened to address urgent problems of environmental protection and socio-economic development. The assembled leaders signed the convention on climate change and convention of Biodiversity, endorsed the Rio-Declaration and the Forest Principles and adopted Agenda 21 for achieving sustainable development in the 21st century. The Commission on Sustainable Development (CSD) was created to monitor and report on the implementation of the Earth Summit Agreement. It was agreed that a five-year review of Earth Summit progress would be made in 1997 by the United Nations General Assembly meeting in special session. Accordingly, a special session of UN General Assembly was held from 23-27 June, 1997 in New York to take stock of how well countries, international organizations and sectors of civil society have responded to the challenge of the Earth Summit. This meeting was known as Earth Summit +5. Notably, Rio + 10 summit was held in Johannesburg in 2002 and Rio +20 was held in Rio-de-Janeiro in 2012.

8. **Consider the following statements:**
   1. **The Sustainable Development Goals were first proposed in 1972 by a global think tank called the 'Club of Rome'.**
   2. **The Sustainable Development Goals have to be achieved by 2030.**

   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

I.A.S. (Pre) 2016

Ans. (b)

Sustainable Development Goals were proposed in 2012 at Rio+20. Hence statement 1 is not correct. The Sustainable Development Goals are officially known as 'Transforming our World: the 2030 Agenda for Sustainable Development'. These are a set of seventeen aspirational "Global Goals" with 169 targets among them. Hence, statement 2 is correct.

9. **Who has propounded the concept of 'Limits to Growth'?**
   (a) Club of Rome
   (b) UNESCO
   (c) Brundtland Commission
   (d) Agenda 21

U.P.P.C.S. (Pre) 2019

Ans. (a)

In April of 1968, 30 people including scientists, educators, economists, humanists, industrialists and government officials met at the Academia dei Lincei in Rome. "The Club of Rome" was born from this meeting as an informal organization. The concept of 'Limits to Growth' was propounded by the Club of Rome.

10. **Given below are two statements, one labelled as Assertion (A) and other as the Reason (R).**

    Assertion (A) : There is a positive relation between Human Development Index (HDI) and Sustainable Development Goals (SDG) ranking of Indian State.

    Reason (R) : The underlying dimension of SDG targets are closely related to education and health aspect.

    Select the correct answer using the codes below:
    (a) Both (A) and (R) are true and (R) is correct explanation of (A)
    (b) Both (A) and (R) are true but (R) is not the correct explanation of (A)
    (c) (A) is true but (R) is false
    (d) (A) is false but (R) is true

U.P.P.C.S. (Pre) 2019

Ans. (a)

The underlying dimension of SDG targets are closely related to education and health aspect as evident in the positive correlation between HDI (Human Development Index) and SDG rankings of Indian State. Hence, both (A) and (R) are true and (R) is the correct explanation of (A).

11. **With reference to the 'Global Alliance for Climate-Smart Agriculture (GACSA)', which of the following statement is/are correct?**
    1. **GACSA is an outcome of the Climate Summit held in Paris in 2015.**
    2. **Membership of GACSA does not create any binding obligations.**
    3. **India was instrumental in the creation of GACSA.**

    Select the correct answer using the code given below:
    (a) 1 and 3 only (b) 2 only
    (c) 2 and 3 only (d) 1, 2 and 3

I.A.S. (Pre) 2018

Ans. (b)

Statement (1) is incorrect because the concept of Climate Smart Agriculture (CSA) was originally developed by FAO in 2010 through the paper "Climate Smart Agriculture: Policies, Practices and Financing for food security, Adaptation and Mitigation." In 2014 an alliance was set up with this issue as its focal point: the GASCA (Global Alliance for Climate Smart Agriculture).
Statement (2) is correct because membership in the Alliance does not create any binding obligations.
Statement (3) is incorrect because India is just a signatory.

12. **The Partnership for Action on Green Economy (PAGE), a UN mechanism to assist countries transition towards a greener and more inclusive economies, emerged at?**
    (a) The Earth Summit on Sustainable Development 2002, Johannesburg.
    (b) The United Nations Conference on Sustainable Development 2012, Rio de Janeiro.
    (c) The United Nations Framework Convention on Climate Change 2015, Paris.

(d) The World Sustainable Development Summit 2016, New Delhi.

I.A.S. (Pre) 2018

Ans. (b)

In 2012, Rio +20 (the United Nations Conference on Sustainable Development) was held in Brazil. The conference's outcome document entitled 'The Future We Want' was a call to action for governments, businesses and the UN alike to support countries interested in the transition to a green economy. PAGE (Partnership for Action on Green Economy) was created as the UN's direct response to this call of action.

13. With reference to 'Agenda 21', sometimes seen in the news, consider the following statements:

1. It is a global action plan for sustainable development.

2. It originated in the World Summit on Sustainable Development held in Johannesburg in 2002.

Which of the following statements given above is/are correct?

(a) 1 only (b) 2 only

(c) Both 1 and 2 (d) Neither 1 nor 2

I.A.S. (Pre) 2016

Ans. (a)

Agenda 21 is a non-binding, voluntarily implemented action plan of the United Nations on Sustainable Development. It is a product of the Earth Summit (UN Conference on Environment and Development) held in Rio-de-Janeiro, Brazil in 1992. Hence only statement 1 is correct.

14. Many transplanted seedlings do not grow because:

(a) The new soil does not contain favourable minerals

(b) Most of the root hairs grip the new soil too hard

(c) Most of the root hairs are lost during transplantation

(d) Leaves get damaged during transplantation

I.A.S. (Pre) 2013

Ans. (c)

Many transplanted seedlings do not grow because most of the root hairs are lost during transplantation. The function of root hairs is to collect water and mineral nutrients present in the soil and take this solution up through the roots to the rest of the plant. These are made up of cellulose and nominal Pectin which helps it as a gelling agent with the soil. Another reason is the use of fertilizers which increases the concentrations of the soil and make it difficult for plants to absorb water. This situation causes plant cells causing the leaves turn brown.

15. Environmental degradation means –

(a) Overall degradation of environmental attributes.

(b) Adverse changes brought in by human activities.

(c) Ecological imbalance because of ecological diversity.

(d) All the above.

U.P.P.C.S. (Pre) 2006

Ans. (d)

Environmental degradation is the deterioration of the environment through depletion of resources such as air, water and soil. Environmental degradation is either natural or by human beings. Hence (d) is the correct answer.

16. Which of the following is related to Protection of Ecological Balance?

1. Forest Policy

2. Environment (Protection) Act

3. Industrial Policy

4. Educational Policy

Select the correct answer using the codes given below:

(a) 1 & 2 (b) 2 & 3

(c) 1,2 & 3 (d) All the above

U.P.P.C.S. (Spl) (Mains) 2004

Ans. (d)

Protection of the ecological balance is directly related to the Forest Policy and the Environmental (Protection) Act, 1986. While Industrial Policy and Education Policy also include the environmental approach. Thus the four policies mentioned in question could be considered as being related to the protection of ecological balance.

17. Concerning 'Global Environment Facility', which of the following statement/s is/are correct?

(a) It serves as the financial mechanism for 'Convention on Biological Diversity' and 'United Nations Framework Convention on Climate Change'

(b) It undertakes scientific research on environmental issues at the global level

(c) It is an agency under OECD to facilitate the transfer of technology and funds to underdeveloped countries with a specific aim to protect their environment

(d) Both (a) and (b)

I.A.S. (Pre) 2014

Ans. (a)

The Global Environment Facility (GEF) was established on the eve of the 1992 Rio Earth Summit to help tackle our planet's most pressing environmental problems. GEF is an international partnership of 183 countries and 18 agencies

that address global environmental issues. It is a financial mechanism for five major international conventions: the Minamata Convention on Mercury, the Stockholm Convention on Persistent Organic Pollutants, the United Nations Convention on Biological Diversity, the United Nations Convention to Combat Desertification and the United Nations Framework Convention on Climate Change. GEF supports multi-stakeholder alliance to preserve threatened ecosystems on land and in the oceans, build green cities, boost food security for a more prosperous, climate resilient world. Naoko Ishii is presently the Chief Executive Officer and Chairperson of the Global Environment Facility.

18. Plachimada which has been in the news for immense damage to its environment lies in –

(a) Karnataka (b) Konkan
(c) Kerala (d) Tamil Nadu

U.P. Lower Sub. (Spl.) (Pre) 2009

Ans. (c)

Plachimada is a small village in Palakkad district of Kerala. It is situated in Chittur block's Perumatty Panchayat of the district. In 2000, this Panchayat gave license to the Hindustan Coca-Cola Beverages Private Limited (HCCBPL) to manufacture Coca-Cola (Coke) and other products viz. Fanta, Limca, Thums Up, Sprite, Kinley, etc. But very soon due to the contamination of groundwater in that locality by the chemical waste discharged by the company, local people started a small-scale protest against the company. Later, this protest was supported by the Panchayat authorities. In the long run, with national as well as international support to this protest against a multinational company (MNC), this movement became an icon of other such movements worldwide.

19. Environment (Protection) Act (EPA) is also known as:

(a) Umbrella Legislation (b) Chhadi Mubarak
(c) Environment Legislation (d) Eco Safety Law

M.P.P.C.S. (Pre) 2013

Ans. (a)

Environment (Protection) Act, 1986 is also know as Umbrella Legislation. In the wake of the Bhopal Tragedy, the Government of India enacted the Environment (Protection) Act of 1986 under Article 253 of the Constitution. The Act is an "umbrella" legislation designed to provide a framework for Central Government coordination of the activities of various Central and State authorities established under previous laws, such as the Water Act and the Air Act.

20. The Genetic Engineering Appraisal Committee is constituted under the:

(a) Food Safety and Standards Act, 2006
(b) Geographical Indications of Goods (Registration and Protection) Act, 1999
(c) Environment (Protection) Act, 1986
(d) Wildlife (Protection) Act, 1972

I.A.S. (Pre) 2015

Ans. (c)

The Genetic Engineering Appraisal Committee is constituted under the Environment (Protection) Act, 1986. On 22 July, 2010 Genetic Engineering Approval Committee was renamed as Genetic Engineering Appraisal Committee. It is the apex body constituted in the Ministry of Environment and Forest under 'Rule for manufacture, use, import, export and storage of hazardous microorganism/genetically engineered organism or cells 1989' under the Environment (Protection) Act 1986.

21. With reference to the circumstances in Indian agriculture, the concept of "Conservation Agriculture" assumes significance. Which of the following fall under the Conservation Agriculture?

1. Avoiding monoculture practices.
2. Adopting minimum tillage.
3. Avoiding the cultivation of plantation crops.
4. Using crop residues to cover the soil surface.
5. Adopting spatial and temporal crop sequencing / crop rotations.

Select the correct answer using the code given below:

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

I.A.S. (Pre) 2018

Ans. (c)

Conservation Agriculture (CA) can be defined by a statement given by the Food and Agricultural Organisation of the United Nations as "a concept for resource - saving agricultural crop production that strives to achieve acceptable profits together with high and sustained production level while concurrently conserving the environment."
Minimum tillage and soil disturbance.
Permanent soil cover with crop residues and live mulches.
Crop rotation and intercropping are the principles of Conservation Agriculture.

22. As a result of their annual survey, the National Geographic Society and an international polling firm Globe Scan gave India top rank in Greendex 2009 score. What is this score?

(a) It is a measure of efforts made by different countries in adopting technologies for reducing the carbon footprint
(b) It is a measure of environmentally sustainable consumer behaviour in different countries
(c) It is an assessment of programs/schemes undertaken by different countries for improving the conservation of natural resources
(d) It is an index showing the volume of carbon credits sold by different countries

I.A.S. (Pre) 2010

Ans. (b)

National Geographic conducted its inaugural Greendex survey in January 2008. That first Greendex survey of 14 countries around the world ranked average consumers in those countries according to the environmental sustainability of their behaviour. Thus, option (b) will be the right answer. In 2009, India was at first place and in 2014 too India retained its position.

23. Which one of the following is the best strategy for environment-friendly sustainable development in Indian agriculture?
(a) Expansion of cultivable land, increased use of superphosphate, urea and effective biocides
(b) Wider popularization of high-yielding crop varieties, better aid, more frequent irrigation and increased frequency of aerial span of inorganic fertilizers and pesticides
(c) Mixed cropping, organic manures, nitrogen-fixing plants and pest-resistant crop varieties
(d) Improved farm implements and machinery, use of potent insecticides to minimize post-harvest grain losses and monoculture cropping practices

I.A.S. (Pre) 1993

Ans. (c)

Mixed cropping, organic manures, nitrogen-fixing plants and pest resistant crop varieties are the best strategy for environment-friendly sustainable development in Indian agriculture.

24. Consider the following statements and select the correct answer from the codes given below:
Assertion (A) : India is a case of an over-urbanised country.
Reason (R) : Most of the large cities in India do not have adequate infrastructure.
Codes:
(a) Both (A) and (R) are correct and (R) explains (A).
(b) Both (A) and (R) are correct but (R) does not explain (A).
(c) (A) is true but (R) is false.
(d) (A) is false but (R) is true.

U.P. P.C.S. (Mains) 2017

Ans. (d)

According to the census of 2011 approximately 121 crore people (68.9%) still live in rural areas as compared to 37.7 crores (31.1%) people living in the urban areas. Although the rate of urbanization in India is high yet the process lacks solutions to provide basic infrastructural amenities like Drinking Water, Transport, Sanitation, Electricity, etc.

25. The investigator of Natural Farming was-
(a) Masanobu Fukuoka (b) M.S. Randhawa
(c) M.S. Swaminathan (d) Norman Borlaug

Uttarakhand P.C.S. (Pre) 2002

Ans. (a)

Masanobu Fukuoka was a Japanese farmer and philosopher famous for his natural farming and revegetation of desertified lands.

26. Which country introduced the Green Army for Environment conservation?
(a) Japan (b) China
(c) Australia (d) Egypt

M.P.C.S.(Pre) 2014

Ans. (c)

The Green Army is a six-month programme for 17-24-year-old youths in Australia to train and work for the environment. Green Army projects include restoring native vegetation, heritage restoration, protecting animal habitats and regenerating wetlands in urban, rural and remote areas. The Green Army Programme will close on 30 June 2018.

27. During the mid 80's decade of twentieth century, the negative aspects of development were discussed at large. Which one among the following was NOT such important?
(a) Degradation of natural resources
(b) Environment pollution
(c) Politics and Development
(d) Displacement and Rehabilitation of masses

U.P.P.C.S.(Pre) 2020

Ans. (c)

During the mid 80's decade of twentieth century, Degradation of natural resources, Environment pollution and Displacement and Rehabilitation of Masses were the negative aspects of development, discussed at large, but Politics and Development was not such important.

Ecology

*__Ecology__ is a branch of science which studies the interactions among organisms and between the organisms and their physical environment.

*The term 'Ecology' was first used in year 1865 by **Reiter**.

***Ernst Haeckel** used the term **Oekologie** instead of Ecology and explained it briefly. The word Oekologie is formed by combining two Greek words **Oikos** (House or living space) and **logos** (Science or Study).

*According to Haeckel **'Ecology is the study of the relation of the animal both to its organic as well as its inorganic environment'.**

*According to Eugene Odum, **'Ecology is the study of structure and function of nature'**.

Figure: Outlines of interrelation among plants, animals and climate

*Now, ecology has been presented with a broad dimension. Now it also includes the study of humans, society and the activities of its physical environment. It is a fundamental natural system having biotic and abiotic components.

*In 1935, **A.G Tansley** proposed the concept of Ecosystem. According to him, Ecosystem is type of a physical system formed by biotic and abiotic components. According to him, ecosystem is an open system. These systems may differ in their size.

***Karl Mobius** called the idea of the ecosystem as Biocoenosis.

***Forbs** called ecosystem as Microcosm.

*Ecosystem is known as the functional unit of nature. *An ecosystem can be as small as water droplets. These kinds of ecosystem are known as Micro ecosystem. On the other hand, it can be as large as an ocean. Our earth is itself an huge ecosystem.

*Biosphere is a thin layer of soil, rock, water and air. It is a basic global system having biotic and abiotic components. *Ecosystem is a functional unit of nature in which biotic factors interact with abiotic factors and forms a living unit.

Characteristics of Ecosystem - *It covers/occupies a definite area in the Biosphere. *The ecosystem is a functional unit of nature.

*Ecosystem has its own productivity. Ecosystem is an open system where there are continuous input and output of energy and substances.

Components of Ecosystem

*An ecosystem is a community of living organisms in conjunction with the non-living components of their environment (things like air, water and mineral soil), interacting as a system.

Important features of the ecosystem are:

*It is normally an open system with a continuous, but variable influx and loss of materials and energy.

*An ecosystem is an overall integration of the whole mosaic of the interacting organisms and their environment.

*It is a basic functional unit.

*It consists of biotic and abiotic components interacting with each other.

*It's functional unit is capable of energy transformation, circulation and accumulation.

*Different types of ecosystem are present in different areas.

*All components that take part in mutual interaction in the biosphere form an ecosystem. Living organisms form biosphere by different biological associations.

*All the organisms and the abiotic components of the environment form the ecosystem of the place. Thus, ecology deals with the organism and its environment.