UNIT 22

ENVIRONMENTAL MANAGEMENT

Points to Remember

- Conservation is a process which is concerned with the use, preservation and proper management of natural resources from destructive activities of human being.
- Conservation of natural resources contributes to the social and economic development of the country.
- Forests of a country constitute a major asset for the people of the country.
- National park is a reserved area for the conservation of entire wildlife including plants and animals.
- Sanctuary is a place reserved exclusively for the use of animals.
- Solar cell is a device that absorbs sunlight and converts it into electric energy.
- Solar water heater does not require electricity, they heat up water directly from sunlight.
- Biogas is produced by the anaerobic decomposition of cow dung.
- The technique of collecting and storing rain water for future purpose is known as rainwater harvesting.
- Unwanted, non-working and outdated electronic products become e-waste.

TEXT BOOK EVALUATION

I. Book Exercise – Fill in the blanks

1. Deforestation leads to _____in rainfall. **Ans.:** Decrease
2. Removal of soil particles from the land is called _____. **Ans.:** Soil erosion
3. Chipko movement is initiated against _____. **Ans.:** Cutting trees / Deforestation
4. _____is a biosphere reserve in Tamilnadu. **Ans.:** Nilgiris
5. Tidal energy is _____ type of energy. **Ans.:** Non-conventional / Renewable
6. Coal, petroleum and natural gas are called _____fuels. **Ans.:** Fossil
7. _____ is the most commonly used fuel for the production of electricity. **Ans.:** Coal

II. Book Exercise – State whether the following statements are true or false: If false correct the statement.

1. Biogas is a fossil fuel.
Ans.: False.
Correct statement : Biogas is a **Bio-fuel**.

2. Planting trees increases the groundwater level.
Ans.: True.

3. Habitat destruction cause loss of wild life.
Ans.: True.

4. Nuclear energy is a renewable energy.
Ans.: False.
Correct statement : Nuclear energy is a **non-renewable** energy.

5. Overgrazing prevents soil erosion.
Ans.: False.
Correct statement : Overgrazing **<u>increases</u>** soil erosion.

6. Poaching of wild animals is a legal act.
Ans.: False.
Correct statement : Poaching of wild animals is a **<u>illegal</u>** act.

7. National park is a protected park.
Ans.: True.

8. Wild life protection act was established in 1972.
Ans.: True.

IV. Book Exercise – Match the items in column-I to the items in column-II:

1.	**Soil erosion**	**(a)**	**energy saving**
2.	**Bio gas**	**(b)**	**acid rain**
3.	**Natural gas**	**(c)**	**removal of vegetation**
4.	**Green house gas**	**(d)**	**renewable energy**
5.	**CFL bulbs**	**(e)**	**CO_2**
6.	**Wind**	**(f)**	**non-renewable energy**
7.	**Solid waste**	**(g)**	**lead and heavy metals**

Ans :

Column I		Column II	
1	Soil erosion	c	Removal of vegetation
2	Bio gas	d	Renewable energy
3	Natural gas	f	Non-renewable energy
4	Green house gas	e	CO_2
5	CFL bulbs	a	Energy saving
6	Wind	b	Acid rain
7	Solid waste	g	Lead and heavy metals

IV. Book Exercise – Choose the best answer

1. Which of the following is / are a fossil fuel? i. Tar ii. Coal iii. Petroleum
a) i only b) i and ii c) ii and iii d) i, ii and iii
Ans.: d) i, ii and iii

2. What are the steps will you adopt for better waste management?
a) reduce the amount of waste formed b) reuse the waste
c) recycle the waste d) all of the above
Ans.: d) All of the above

3. The gas released from vehicles exhaust are
i. cCarbon monoxide ii. Sulphur dioxide iii. Oxides of nitrogen
a) i and ii b) i and iii c) ii and iii d) i, ii and iii
Ans.: d) i, ii and iii

4. Soil erosion can be prevented by
a) deforestation b) afforestation c) over grazing d) removal of vegetation
Ans.: b) Afforestation

5. A renewable source of energy is

a) petroleum b) coal c) nuclear fuel d) trees

Ans.: d) trees

6. Soil erosion is more where there is

a) no rain fall b) low rainfall c) rain fall is high d) none of these

Ans.: c) rain fall is high

7. An inexhaustible resources is

a) wind power b) soil fertility c) wild life d) all of the above

Ans.: a) wind power

8. Common energy source in village is

a) electricity b) coal c) biogas d) wood and animal dung

Ans.: d) wood and animal dung

9. Green house effect refers to

a) cooling of earth b) trapping of UV rays c) cultivation of plants d) warming of earth

Ans.: d) warming of earth

10. A cheap, conventional, commercial and inexhaustible source of energy is

a) hydropower b) solar energy c) wind energy d) thermal energy

Ans.: a) hydropower

11. Global warming will cause

a) raise in level of oceans b) melting of glaciers c) sinking of islands d) all of these

Ans.: d) all of these

12. Which of the following statement is wrong with respect to wind energy

a) wind energy is a renewable energy
b) the blades of wind mill are operated with the help of electric motor
c) production of wind energy is pollution free
d) usage of wind energy can reduce the consumption of fossil fuels.

Ans.: b) the blades of wind mill are operated with the help of electric motor

V. Book Exercise – Answer in a sentence

1. What will happen if trees are cut down?

Effect of cutting trees

i) Ecological problems like floods and drought
ii) Soil erosion
iii) Loss of wild life
iv) Extinction of species
v) Imbalance of biogeochemical cycles
vi) Alteration of climatic conditions and
vii) Desertification.

2. What would happen if the habitat of wild animals is disturbed?

The habitat provides food, shelter and protection to the animals. If the habitat is disturbed then the animals become unprotected and may decline in numbers and become endangered.

3. What are the agents of soil erosion?

Agents of soil erosion are

i) High velocity of wind,
ii) Air currents,
iii) Flowing water,

iv) Landslide,
v) Human activities (deforestation, farming and mining) and
vi) Overgrazing by cattle.

4. Why fossil fuels are to be conserved?

Conservation of fuels is essential due to following reasons:

i) They are limited. Once they are exhausted there will be none.
ii) There are no ideal alternative for fossil fuels.
iii) We have to use in a control way to control global warming.

5. Solar energy is a renewable energy. How?

Solar energy is the energy obtained from the sun. It is a renewable free source of energy that is sustainable and totally inexhaustible, unlike fossil fuels which are finite.

6. How are e-wastes generated?

E-wastes are generally called as electronic wastes. They are generated from the spoiled, outdated, non-repairable electrical and electronic devices.

VI. Book Exercise – Short answer questions.

1. What is the importance of rainwater harvesting?

Rainwater harvesting helps to

i) Overcome the rapid depletion of ground water levels.
ii) To Meet the increase demand of water.
iii) Reduces flood and soil erosion
iv) Water stored in ground is not contaminated by human and animal wastes and hence can be used for drinking purpose.

2. What are the advantages of using biogas?

Advantages of biogas

i) It burns without smoke and therefore causes less pollution.
ii) An excellent way to get rid of organic wastes like bio-waste and sewage material.
iii) Left over slurry is a good manure rich in nitrogen and phosphorus
iv) It is safe and convenient to use
v) It can reduce the amount of greenhouse gases emitted.

3. What are the environmental effect caused by sewage?

Careless disposal of sewage water leads to creation of a chain of problems like spreading of diseases, eutrophication, increase in Biological Oxygen Demand (BOD), etc.

i) Detergents released in water contain phosphates and they allow the growth of algae and water hyacinths.
ii) Pathogens present in sewage water are responsible for spreading different kinds diseases. Stagnant water fosters the growth of mosquitoes, which in turn causes diseases like malaria.
iii) Toxins released in rivers through sewage water are consumed by fish and other aquatic organisms; thus, the possibility of toxins entering the food chain increases manifold.
iv) The sewage water dumped in oceans can affect the coral reefs to a great extent. The toxins present in polluted water inhibit the growth of corals.
v) Water bodies in their natural form contain small amounts of chemical compounds like bicarbonates, nitrates, chlorides, sulphates, etc. So water becomes unsuitable for drinking and irrigation.

4. What are the consequences of deforestation?

Consequences of Deforestation – Deforestation gives rise to ecological problems like floods, drought, soil erosion, loss of wild life, extinction of species, imbalance of biogeochemical cycles, alteration of climatic conditions and desertification.

VII. Book Exercise – Long answer questions

1. How does rainwater harvesting structures recharge ground water?

Rainwater harvesting is a technique of **collecting and storing rainwater** for future use. It is a traditional method of storing rain water in underground tanks, ponds, lakes, check dams and used in future. The main purpose of rainwater harvesting is to make the rainwater percolate under the ground so as to recharge **'groundwater level'**.

Methods of rainwater harvesting :

i) **Roof top rainwater harvesting:** Roof-tops are excellent **rain catchers**. The rain water that falls on the roof of the houses, apartments, commercial buildings etc. is collected and stored in the surface tank and can be used for domestic purpose.

ii) **Recharge pit:** In this method, the rainwater is first collected from the roof tops or open spaces and is directed into the **percolation pits** through pipes for filtration. After filtration the rainwater enters the **recharge pits** or **ground wells**.

2. How will you prevent soil erosion?

i) Retain vegetation cover, so that soil is not exposed.
ii) Cattle grazing should be controlled.
iii) Crop rotation and soil management improve soil organic matter.
iv) Runoff water should be stored in the catchment.
v) Reforestation, terracing and contour ploughing.
vi) Wind speed can be controlled by planting trees in form of a shelter belt.

3. What are the sources of solid wastes? How are solid wastes managed?

Sources of solid waste : i) Municipal wastes ii) Hospital wastes iii) Industrial wastes and iv) e-wastes

Solid-waste management It involves the collection, treatment and proper disposing of solid material that is discarded from the household and industrial activities.

i) **Segregation:** It is the separation of different type of waste materials like biodegradable and non biodegradable wastes.

ii) **Sanitary landfill :** Solid wastes are dumped into low lying areas. The layers are compacted by trucks to allow settlement. The waste materials get stabilised in about 2-12 months. The organic matter undergoes decomposition.

iii) **Incineration :** It is the burning of non-biodegradable solid wastes (medical wastes) in properly constructed furnace at high temperature.

iv) **Composting :** Biodegradable matter of solid wastes is digested by microbial action or earthworms and converted into humus.

v) **Recycling of wastes :**

a) Papers from old books, magazines and newspapers are recycled to produce papers in paper mills.
b) Agricultural wastes like coconut shells, jute cotton stalk, bagasse of sugarcane can be used to make paper and hard board. Paddy husk can be used as livestock fodder.
c) Cow dung and other organic wastes can be used in gobar gas plant to provide biogas and manure for fields.

4. Enumerate the importance of forest.

Importance of forest.

- Forests are an important component of our environment.
- Forests consist of economically and medicinally valuable microorganisms, flowering plants, shrubs, climbers and dense trees.
- Forests provide a vast habitat for wild animals.

- ✦ Forests also contribute to the economic development of our country.
- ✦ Forests are important source for a wide range of renewable natural resource.
- ✦ They provide wood, food, fodder, fibre and medicine.
- ✦ Forests act as carbon sink, regulate climatic conditions, increase rainfall, reduce global warming, prevent natural hazards like flood and landslides, protect wildlife and also act as catchments for water conservation.
- ✦ They also play a vital role in maintaining the ecological balance.

5. What are the consequences of soil erosion?

Removal of **upper layer of soil** by wind and water is called soil erosion. Soil erosion causes a significant loss of humus, nutrients and decrease the fertility of soil.

i) **Fertility loss and land degradation:** The direct and primary effect of soil erosion is soil loss and nutrient leaching resulting in reduction of land productivity.

ii) **Air Pollution :** Wind erosion picks up dust particles of the soil and throws them into the air, causing air pollution.

iii) **Destruction of Infrastructure :** Soil erosion can affect infrastructural projects such as dams and drainages. The accumulation of soil sediments in dams and drainages can reduce their operational lifetime and efficiency.

iv) **Desertification :** Soil erosion is a major driver of desertification. It gradually transforms a habitable land into deserts.

v) **Water Pollution:** Soils eroded from agricultural lands carry pesticides, heavy metals, and fertilizers which are washed into streams and major water ways. This leads to water pollution and damage to marine and freshwater habitats.

vi) **Clogging of Waterways :** Accumulated sediments can also cause clogging of water ways and raises the water level leading to flooding.

6. Why is the management of forest and wildlife resource considered as a challenging task?

i) People living in and around forests are dependent on forest ie plants and animals products for various aspects of their life such as livelihood.

ii) The forest department of the government who judicially allowed for owning the land and controlling the resources from forests.

iii) The industrialists who use forest products such as timber, leaves, latex and raw materials for their industries.

iv) Global warming and climate change results in water scarcity and changes in rainfall pattern in forest area.

v) Lack of proper law enforcement and lack of sufficient number of guards lead to indiscriminate illegal poaching affects wildlife populations and the environment.

VIII. Book Exercise – Assertion and reason type questions:

Direction : In each of the following question a statement of assertion(A) is given and a corresponding statement of reason (R). Of the four statements given below mark the correct answer.

a) Both assertion and reason are true and reason is correct explanation of assertion.

b) Both assertion and reason are true but reason is not the correct explanation of assertion.

c) Assertion is true but reason is false.

d) Both assertion and reason are false.

1. Assertion: Rainwater harvesting is to collect and store rain water.

Reason: Rainwater can be directed to recharge the underground water source.

Ans : a) Both assertion and reason are true and reason is correct explanation of assertion

2. Assertion: Energy efficient bulbs like CFL must be used to save electric energy.

Reason: CFL bulbs are costlier than ordinary bulbs, hence using ordinary bulbs can save our money.

Ans : c) Assertion is true but reason is false

IX. Book Exercise – Higher Order Thinking Skills (HOTS)

1. Although coal and petroleum are produced by degradation of biomass, yet we need to conserve them. Why?

The formation of coal and petroleum is a very slow process and takes very long period of time for renewal. The coal and petroleum reserves can get exhausted if we continue using them at a rapid rate. So it is necessary to conserve or save coal and petroleum resources for the future use, which can be done by reducing their consumption.

2. What are the objectives for replacing non-conventional energy resources from conventional energy resources?

The objective in using non-conventional (Renewable) resources is to reduce the pessimistic environmental effects associated with conventional (Non-renewable) resources such as coal, petroleum and natural gas. Reusable or non-conventional energy is greener and keeps our planet clean. We need to make sure our future generation need not have to walk around with an oxygen mask on their face.

3. Why is the Government imposing ban on the use of polythene bags and plastics? Suggest alternatives. How is this ban likely to improve the environment?

Government is imposing ban on polythene bags and plastics, because they are non-biodegradable substances and harmful to the environment .

Alternatives to Polythene bags and plastics : Instead of polythene bag, "Paper Bags" and "cloth bags " and instead of non-biodegradable plastics, bio-plastics can be used as they are biodegradable and will get decomposed and they will not pollute the environment.

This ban will improve the environment in the following ways :-

i) It will help to prevent land and water pollution .

ii) It will lead to less productions of polythenes , which help in reduction of harmful gases from factories.

X. Book Exercise – Value based questions

1. Why is it not possible to use solar cells to meet our energy needs? State three reason to support to your answer.

Solar cells are not used in our daily routine because :

i) Solar cells work on the basis of solar energy which is not provided at night. Moreover in the winter season sunlight is minimal.

ii) They take lot of time in completing any work depending on the intensity of light.
For Eg : solar cookers take much time in cooking food in low intensity of light.

iii) The installing cost of solar cell panel is high as the silicon wafer is very expensive also same for the silver which is used in connecting solar cells.

iv) Only DC electricity is produced by SPV (Solar Photovoltaic system).To operate any AC device, this dc has to be converted in as by using inverters.

v) The efficiency of energy conversion is low as compared to other means of generating electricity.

2. How would you dispose the following wastes?

a. Domestic wastes like vegetable peels

b. Industrial wastes like metallic cans

Can the disposal protect the environment? How?

a) Disposal of vegetable peels and metallic cans

i) Peels and scrapings from fruit and vegetables can be composted along with other degradable matter.

ii) Industrial waste like metallic cans can be recycled as they are non - biodegradable.

b) Disposal can protect environment :

i) Biodegradable matter of solid wastes such as Peels and scrapings from fruit are digested by microbial action or earthworms and converted into humus.

ii) Recycling of industrial waste like metallic cans helps to reduce air pollution, water pollution, greenhouse gas emissions and often a conservation of global resources.

3. List any three activities based on 3R approach to conserve natural resources.

First 'R' - Reuse : Bring cloth bags to the store with you instead of asking shopkeeper for new paper or polythene bags. You can use cloth bags again and again. You can save some trees and can prevent pollution caused by polythene bags.

Second 'R' – Reduce : When we reduce the use of electric power, we reduce the amount of toxic fumes released by power plants, conserve the earth's natural resources and protect ecosystems from destruction.

Third 'R' – Recycle : Many of the things we use every day, like paper bags, soda cans, and milk cartons, are made out of materials that can be recycled. Recycled items are put through a process that makes it possible to create new products out of the materials from the old ones.

Additional – Choose the best answer

1. The use of natural resources in excess and unplanned way leads to _____ in the environment.

a) Equilibrium b) Steadiness c) Balance d) Imbalance

Ans.: d) Imbalance

2. _____ provides a vast natural habitat for wild animals.

a) Garden b) Forest c) Zoo d) Museum

Ans.: b) Forest

3. _____ is a threat to the economy, quality of life and future of the environment.

a) Deforestation b) Afforestation c) Reforestation d) Social forestry

Ans.: a) Deforestation

4. The Chipko movement was started in the year _____

a) 1970 b) 1973 c) 1980 d) 1983

Ans.: b) 1973

5. The Chipko movement originated in the _____ district of Uttar Pradesh (now Uttarakhand).

a) Dehradun b) Haridwar c) Uttarkashi d) Chamoli

Ans.: d) Chamoli

6. One of the following is NOT the effect of deforestation.

a) Desertification b) Soil erosion c) Flourish of wild life d) Extinction of species

Ans.: c) Flourish of wild life

7. Alteration of climatic conditions is one of the effects of

a) Afforestation b) Deforestation c) Reforestation d) Social forestry

Ans.: b) Deforestation

8. Van Mahotsav is an annual tree planting movement in India began in _____.

a) 1945 b) 1947 c) 1950 d) 1960

Ans.: c) 1950

9. When was the National Forest Policy established?

a) 1950 b) 1952 c) 1980 d) 1988

Ans.: b) 1952

10. Forest Conservation Act came into force in the year _____.

a) 1950 b) 1952 c) 1980 d) 1988

Ans.: c) 1980

11. Exploitation of wildlife resources has decreased global wildlife population by _____% between 1970 and 2014.

a) 5 b) 10 c) 32 d) 52

Ans.: d) 52

12. The Wildlife protection Act was established in _____.

a) 1950 b) 1952 c) 1972 d) 1988

Ans.: c) 1972

13. Jim Corbett National Park (India's first National Park) is established in _____.

a) 1936 b) 1952 c) 1972 d) 1988

Ans.: a) 1936

14. Jim Corbett National Park (India's first National Park) is located in _____.

a) West Bengal b) Assam c) Uttarakhand d) Uttar Pradesh

Ans.: c) Uttarakhand

15. Total number of biosphere reserves in India is _____.

a) 8 b) 10 c) 12 d) 15

Ans.: d) 15

16. Human activities responsible for soil erosion is

a) Deforestation b) Farming c) Mining d) All the above

Ans.: d) All the above

17. One of the following is NOT the preventive way of soil erosion.

a) Retaining the vegetation cover b) Overgrazing by cattle

c) Storage of runoff water d) Contour ploughing

Ans.: b) Overgrazing by cattle

18. One of the following can prevent soil erosion.

a) Deforestation b) High velocity of wind c) Vegetation cover d) Runoff water

Ans.: c) Vegetation cover

19. Example for non – renewable energy resource.

a) Biofuel b) Nuclear power

c) Hydroelectric energy d) Geothermal energy

Ans.: b) Nuclear power

20. Example for non-conventional energy resource

a) Coal b) Bio-fuel c) Natural gas d) Nuclear power

Ans.: b) Bio-fuel

21. Bio-fuel, biomass energy, geothermal energy, water energy (hydroelectric energy and tidal energy), solar energy, wave energy and wind energy are examples for _____ energy resources.

a) Renewable b) Inexhaustible c) Non – conventional d) All the above

Ans.: d) All the above

22. India is the third largest consumer of crude oil in the world.

a) Second b) Third c) Fourth d) Fifth

Ans.: b) Third

23. The main component of Biogas _____.

a) Hydrogen b) Methane c) Carbon dioxide d) Hydrogen sulphide

Ans.: b) Methane

24. _____ is produced by the anaerobic decomposition of animal wastes (cow dung) and plant wastes.

a) Natural Gas b) LPG c) Biogas d) Shale gas

Ans.: c) Biogas

25. The world's largest and tallest wind turbine is situated in _____.

a) Kanyakumari b) California c) Hawaii d) Muppanthal

Ans.: c) Hawaii

26. It is available in abundance in our country and is free of cost.

a) Nuclear power b) Solar energy c) Tidal energy d) Wind energy

Ans.: b) Solar energy

27. One of the following is NOT an energy efficient appliance

a) CFL b) LED c) Solar water heater d) Tungsten bulb

Ans.: d) Tungsten bulb

28. _____ present in E-Wastes causes asthmatic bronchitis.

a) Mercury b) Cadmium c) Chromium d) Lead

Ans.: c) Chromium

29. _____ present in E-Wastes causes damages to central and peripheral nervous system and affects brain development in children.

a) Mercury b) Cadmium c) Chromium d) Lead

Ans.: d) Lead

30. Unwanted, non-working and outdated electronic products become _____.

a) Bio-waste b) Solid Waste c) E-waste d) Metal waste

Ans.: c) E-waste

Additional – Fill in the blanks

1. Proper utilization and management of nature and its resources is termed as _____.

Ans.: Conservation.

2. The destruction of large area of forests is known as _____ . **Ans.:** Deforestation
3. _____ is a an annual tree planting festival and is usually celebrated between 1st July and 7th July.

Ans.: Van Mahotsav

4. India has an area of _____ lakh hectare reserved forests. **Ans.:** 752.3
5. India has an area of _____ lakh hectare protected forests. **Ans.:** 215.1
6. Utilization of common land to produce firewood, fodder and timber for the benefit of the rural community is known as _____. **Ans.:** Social forestry
7. _____ programme relieves pressure on existing forests and to safeguard future of tribals.

Ans.: Social forestry

8. The undomesticated animals living in their natural habitats are referred as _____. **Ans.:** Wild life
9. India's first National Park is _____. **Ans.:** Jim Corbett National Park
10. The _____ is a biosphere reserve in Tamil Nadu. **Ans.:** Nilgiris
11. WWF stand for_____. **Ans.:** World Wildlife Fund
12. WPSI stands for _____. **Ans.:** Wildlife Protection Society of India
13. The first Indian woman to strike an International reputation as wildlife photographer is _____.

Ans.: Rathika Ramasamy

14. A photo-book of Rathika Ramasamy on wildlife titled "_____" was published in November 2014.
Ans.: The best of wildlife moments
15. Project Tiger was launched in the year _____. **Ans.:** 1973
16. Project Elephant was launched in the year _____. **Ans.:** 1992
17. Crocodile Conservation Project was launched in _____. **Ans.:** 1976
18. Sea Turtle Conservation Project was launched in _____. **Ans.:** 1999
19. Removal of upper layer of soil by wind and water is called _____. **Ans.:** Soil erosion
20. Soil erosion causes a significant loss of humus, nutrients and decrease the _____ of soil.
Ans.: Fertility
21. High velocity of wind, air currents, flowing water, landslide and overgrazing by cattle are agents of _____. **Ans.:** Soil erosion
22. The expansion of possible _____ resources is directly related with the pace of agricultural and industrial development. **Ans.:** Energy
23. Energy obtained from sources that cannot renew themselves over a short period of time is known as _____. **Ans.:** Non-renewable energy
24. The _____ energy resources are available in unlimited amount in nature. **Ans.:** Renewable
25. When the accumulating sediment layers produce heat and pressure, the remains of the organisms are gradually transformed into_____ . **Ans.:** Hydrocarbons
26. Fossil fuels are formed from the degradation of _____ buried deep under the earth millions of years ago.
Ans.: Biomass
27. Mostly _____ is used for generation of electricity at Thermal power plants. **Ans.:** Coal
28. Petroleum also known as _____which is processed in oil refineries to produce petrol and diesel.
Ans.: Crude oil
29. Kerosene and LPG are referred as _____ fuel. **Ans.:** Domestic
30. Sulphur and nitrogen oxides produced by _____oil refinery have changed white marbles of Taj Mahal into yellow. **Ans.:** Mathura
31. Solar cells or Photovoltaic devices is made up of _____. **Ans.:** Silicon
32. _____ made up of silicon that converts sunlight directly into electricity.
Ans.: Solar cells or Photovoltaic devices
33. Solar cell produces _____ without polluting the environment. **Ans.:** Electricity
34. Arrangement of many solar cells side by side connected to each other is called _____.
Ans. : Solar panel
35. Methane, Hydrogen sulphide, Carbon dioxide and hydrogen are the components of _____.
Ans.: Biogas
36. Biogas is also commonly called as '_____ ' since the starting material used is cow dung.
Ans.: Gobar gas
37. The soft finely stratified sedimentary rock is called _____. **Ans.:** Shale
38. Natural gas that is trapped within soft finely stratified sedimentary rock is called as _____.
Ans.: Shale gas
39. Shale gas is extracted by a technique called _____. **Ans.:** Hydraulic fracturing
40. _____ technique to extract shale gas could affect groundwater reserves, drinking water resources and the fertility of the soil. **Ans.:** Hydraulic fracturing

41. Million gallons of water is needed to break and release the _____ gas. **Ans.:** Shale
42. One wind turbine can produce electricity for _____ homes. **Ans.:** 300
43. _____ is a machine that converts the energy of wind into rotational energy by broad blade attached to the rotating axis. **Ans.:** Windmill
44. _____ plants converts the kinetic energy of flowing water into electricity. **Ans.:** Hydropower
45. The energy obtained from the movement of water due to ocean tides is known a s_____.
Ans.: Tidal energy
46. The technique of collecting and storing rainwater for future use is called _____.
Ans.: Rainwater harvesting
47. CFL stands for _____. **Ans.:** Compact Fluorescent Lamps
48. LED stands for _____. **Ans.:** Light Emiting Diode
49. Electronic wastes are commonly called as _____. **Ans.:** E-Wastes
50. _____ is the fourth oldest dam in the world. **Ans.:** Kallanai Dam or Grand Anicut
51. Kallanai Dam or Grand Anicut was constructed by King _____ in the 2nd century A.D.
Ans.: Karikala Chola
52. In today's electronic era 66 % of E-wastes consists _____ components . **Ans.:** Computer
53. The particles that settle out from the suspension is known as _____. **Ans.:** Sludge
54. Burning of PVC produces _____ which can cause developmental and reproductive problems, damages the immune system. **Ans.:** Dioxin
55. The burning of non-biodegradable solid wastes (medical wastes) is known as _____. **Ans.:** Incineration
56. The _____ approach such as Reduce, Reuse and Recycle may be followed for effective waste management. **Ans.:** 3R
57. The use, preservation and proper management of natural resources from destructive activities of human being is called _____. **Ans.:** Conservation
58. _____ is a reserved area for the conservation of entire wildlife including plants and animals.
Ans.: National park
59. _____ is a place reserved exclusively for the use of animals. **Ans.:** Sanctuary
60. _____ is a device that absorbs sunlight and converts it into electric energy. **Ans.:** Solar cell

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Additional – True or false (If false give the correct statement)

1. **Conservation of natural resources makes important contributions to the social and economic development of the country.**
   Ans.: True.
2. **A judicious balance should be maintained between exploitation of resources and its replenishment.**
   Ans.: True.
3. **India is losing about 1.5 million hectares of forest cover every day.**
   Ans.: False.
   Correct statement : India is losing about 1.5 million hectares of forest cover every **year**.
4. **The name of the movement 'Chipko' comes from the word 'embrace', as the villagers hugged the trees and encircled them to prevent them from being cut.**
   Ans.: True.
5. **Jim Corbett National Park (India's first National Park) is located in Uttar Pradesh.**
   Ans.: False.
   Correct statement : Jim Corbett National Park (India's first National Park) is located in **Uttarakhand**.

6. **Energy is an important input for development.**
   Ans.: True.
7. **The expansion of possible energy resources is directly related with the pace of agricultural and industrial development.**
   Ans.: True.
8. **Non – renewable energy resources are available in unlimited amount in nature.**
   Ans.: False.
   Correct statement : Non – renewable energy resources are available in **limited** amount in nature.
9. **Coal, petroleum, natural gas and nuclear power are the conventional energy resources.**
   Ans.: True.
10. **Fossil fuels are formed by natural process, such as aerobic decomposition of buried dead organisms.**
    Ans.: False.
    Correct statement : Fossil fuels are formed by natural process, such as **anaerobic** decomposition of buried dead organisms.
11. **India is the third largest consumer of crude oil in the world, after the United States and China.**
    Ans.: True.
12. **The formation of fossil fuels is a very rapid process and takes very short period of time for renewal.**
    Ans.: False.
    Correct statement : The formation of fossil fuels is a very **slow** process and takes very long period of time for renewal.
13. **If electricity is saved, it will in turn reduce the use of coal.**
    Ans.: True.
14. **Nearly 75 % of biogas is composed of hydrogen.**
    Ans.: False.
    Correct statement : Nearly 75 % of biogas is composed of **methane**.
15. **Chlorination and ultraviolet (UV) radiation treatment any remove any microorganism contamination in water.**
    Ans.: True.
16. **Biogas is produced by the aerobic decomposition of cow dung.**
    Ans.: False.
    Correct statement : Biogas is produced by the **anaerobic** decomposition of cow dung.

Additional – Match the following

Section – I :

1.	**Chipko**	**(a)**	**Wildlife photography**
2.	**Deforestation**	**(b)**	**Photovoltaic devices**
3.	**Afforestation**	**(c)**	**Exhaustible**
4.	**Jim Corbett**	**(d)**	**Domestic fuel**
5.	**Nilgiris**	**(e)**	**First National Park**
6.	**Rathika Ramasamy**	**(f)**	**Embrace**
7.	**Renewable**	**(g)**	**Desertification**
8.	**Non-renewable**	**(h)**	**Van Mahotsav**
9.	**Solar cells**	**(i)**	**Inexhaustible**
10.	**LPG**	**(j)**	**Biosphere reserve**

Ans :

1	Chipko	f	Embrace
2	Deforestation	g	Desertification
3	Afforestation	h	Van Mahotsav

4	Jim Corbett	e	First National Park
5	Nilgiris	j	Biosphere reserve
6	Rathika Ramasamy	a	Wildlife photography
7	Renewable	i	Inexhaustible
8	Non-renewable	c	Exhaustible
9	Solar cells	b	Photovoltaic devices
10	LPG	d	Domestic fuel

Section – II :

1.	**Biogas**	**(a)**	**Medical wastes**
2.	**Fossils**	**(b)**	**Hydraulic fracturing**
3.	**Solar Cells**	**(c)**	**Remove microorganism**
4.	**Shale gas**	**(d)**	**Dioxin**
5.	**Kallanai Dam**	**(e)**	**Silicon**
6.	**E-Waste**	**(f)**	**Asthmatic bronchitis**
7.	**Chlorination**	**(g)**	**Earth's crust**
8.	**Chromium**	**(h)**	**Computer parts**
9.	**PVC**	**(i)**	**Grand Anicut**
10.	**Incineration**	**(j)**	**Methane**

Ans :

1	Biogas	j	Methane
2	Fossils	g	Earth's crust
3	Solar Cells	e	Silicon
4	Shale gas	b	Hydraulic fracturing
5	Kallanai Dam	i	Grand Anicut
6	E-Waste	h	Computer parts
7	Chlorination	c	Remove microorganism
8	Chromium	f	Asthmatic bronchitis
9	PVC	d	Dioxin
10	Incineration	a	Medical wastes

Additional – Assertion and Reason (2 Marks)

Direction : In each of the following question a statement of assertion(A) is given and a corresponding statement of reason (R). Of the four statements given below mark the correct answer.

a) Both assertion and reason are true and reason is correct explanation of assertion.
b) Both assertion and reason are true but reason is not the correct explanation of assertion.
c) Assertion is true but reason is false.
d) Both assertion and reason are false.

1. **Assertion :** Removal of upper layer of humus and minerals rich soil by wind and water is called soil erosion.
   Reason : Soil erosion causes loss of humus, nutrients and increase the fertility of soil.
   Ans : (c) Assertion is true but reason is false.

2. **Assertion :** Forests contribute to the economic development of our country.
   Reason : They provide wood, food, fodder, fibre and medicine.
   Ans : (a) Both assertion and reason are true and reason is correct explanation of assertion.

3. **Assertion :** The energy resources which cannot renew themselves over a short period of time is known as renewable energy.
   Reason : Renewable energy resources are available in limited amount in nature.
   Ans : (d) Both assertion and reason are false.

4. **Assertion :** Fossil fuels are formed by anaerobic decomposition of buried dead organisms, over millions of years.
   Reason : Heat and pressure produced by sediment layers transform the remains of the organisms into hydrocarbons.
   Ans : (a) Both assertion and reason are true and reason is correct explanation of assertion.

5. **Assertion :** If electricity is saved, it will in turn reduce the use of coal.
   Reason : Solar cells convert sunlight directly into electricity.
   Ans : (b) Both assertion and reason are true but reason is not the correct explanation of assertion.

6. **Assertion :** The coal and petroleum reserves can get exhausted if we continue using them at a rapid rate.
   Reason : The formation of these fossil fuels is a very slow process and takes very long period of time for renewal.
   Ans : (a) Both assertion and reason are true and reason is correct explanation of assertion.

7. **Assertion :** Deforestation is the destruction of large area of forests.
   Reason : Social forestry relieves pressure on existing forests and to safeguard future of tribals.
   Ans : (b) Both assertion and reason are true but reason is not the correct explanation of assertion.

8. **Assertion :** Wild life refers to the undomesticated animals living in their natural habitats.
   Reason : Conservation of forest and wildlife are not interrelated with each other.
   Ans : (c) Assertion is true but reason is false.

9. **Assertion :** Forests are major factor of environmental concern.
   Reason : Forests regulate climatic conditions, increase rainfall and reduce global warming.
   Ans : (a) Both assertion and reason are true and reason is correct explanation of assertion.

10. **Assertion :** Coal and Petroleum are bio-fuels.
    Reason : Coal and Petroleum are formed by the decomposition of animal wastes (cow dung) and plant wastes.
    Ans : (d) Both assertion and reason are false.

Additional – Answer in a sentence (1 mark)

1. What is Environmental management?
Environmental management deals with the different aspects of environment, its structure, function, its quality and its maintenance including conservation of its living and non-living components.

2. What is meant by conservation of nature?
Conservation is a process which is concerned with the use, preservation and proper management of natural resources from destructive activities of human being.

3. Define wild life.
Wild life refers to the undomesticated animals living in their natural habitats (forests, grasslands and deserts) an area without human habitation.

4. Which is the first National Park established India?
Jim Corbett National Park was the first to be established in 1936 in Uttarakhand, India.

5. Define Soil Erosion.
Removal of The top layers of soil contain humus and mineral salts, which are vital for the growth of plants. Removal of this top soil by wind and water is called soil erosion.

6. How is Taj Mahal affected by pollution?

The Mathura oil refinery owned by Indian Oil Corporation present around Agra produce sulphur and nitrogen oxides. The white marble became yellow due to air pollution.

7. What materials are used on solar panels to allow them to produce electricity?

Solar cells (Photovoltaic devices) are made up of silicon that converts sunlight directly into electricity.

8. What is the chemicalcomposition of biogas?

Biogas is the mixture of methane (nearly 75 %), hydrogen sulphide, carbon dioxide and hydrogen.

9. What do Solar thermal power plant do?

In solar thermal power plants, many solar panels are used to concentrate sun rays, to heat up water into steam. The steam is used to run the turbines to produce electricity.

10. How is biogas produced from biomass?

Biogas is produced by the decomposition of animal wastes (cow dung) and plant wastes in the absence of oxygen.

11. What is shale gas?

Shale gas refers to natural gas that is trapped within shale formations. Shales are fine-grained sedimentary rocks. These rocks contain fossil fuels like oil and gas in their pores.

12. How is shale gas extracted?

The fuel is extracted by a technique called hydraulic fracturing i.e drilling or well boring of sedimentary rocks layers to reach productive reservoir layers.

13. What is tidal energy ?

Tidal energy is the energy obtained from the movement of water due to ocean tides.

14. What are E-Wastes?

E-wastes are generally called as electronic wastes, which includes the spoiled, outdated, non-repairable electrical and electronic devices.

Additional – Short answer question (2 mark)

1. What is Deforestation? Why does it happen?

- Deforestation is the destruction of large area of forests.
- Deforestation happens for many reasons like intensive agriculture, urbanization, construction of dams, roads, buildings and industries, hydroelectric projects, forest fires, construction of mountain and forest roads.

2. Write a note on Chipko movement.

- The Chipko movement was a non-violent agitation in 1973 that was aimed at protection and conservation of trees.
- The name of the movement 'Chipko' comes from the word 'embrace', as the villagers hugged the trees and encircled them to prevent them from being cut.
- The movement originated in the Chamoli district of Uttar Pradesh (now Uttarakhand).

3. Why do we need to conserve wild life?

- Wildlife plays an important role in balancing the environment and provides stability to different natural processes of nature.
- They are needed for maintaining biological diversity.
- They help in promoting economic activities that generates revenue through tourism.
- They provide substances used in both the pharmaceutical industry and traditional medicine.

4. What are non-renewable or exhaustible energy resources? Give examples.

Energy obtained from sources that cannot renew themselves over a short period of time is known as non-renewable energy. These are available in limited amount in nature.

Examples :

- Coal,

- Petroleum,
- Natural gas and
- Nuclear power.

5. What are conventional energy resources?

Conventional energy means the energy source which is obtained from fixed reserves in nature like coal, petroleum and natural gas. In other words conventional energy is also termed as non-renewable energy sources, or fossil fuels.

6. What are renewable or inexhaustible energy resources ? Give examples.

These energy resources are available in unlimited amount in nature and they can be renewed over a short period of time, inexpensive and can be harvested continuously.

Examples :

- Biofuel,
- Biomass energy,
- Geothermal energy,
- Water energy (hydroelectric energy and tidal energy),
- Solar energy,
- Wave energy and
- Wind energy.

7. What are the uses of Petroleum?

- Petroleum also known as crude oil is processed in oil refineries to produce petrol and diesel which are used to run automobiles, trucks, trains, ships and airplanes etc.
- Kerosene and LPG (Liquefied Petroleum Gas) obtained from petroleum is used as domestic fuel for cooking food.

8. What are the uses of solar cells?

- It can be used for street lighting, traffi c signals, water pumping, battery charging system etc.
- It is used in artifi cial satellites and space probes
- It provides radio and TV transmission to remote areas
- It is used in calculators, electronic toys and watches.

9. What are the uses of biogas?

- It is used as fuel for cooking .
- It is used to run motors and pump sets.
- It is used to generate electricity.

10. What are Environmental concerns of shale gas?

- Shale drilling could affect groundwater reserves, which can contaminate the drinking water resources and also affect the fertility of the soil.
- Million gallons of water is needed to break and release the shale gas, which inturn can affect the water table.

11. What are the advantages of wind energy?

- Wind energy is free, eco-friendly, renewable source of energy.
- It does not cause pollution.
- Expenses on periodic maintenance is low when compared to the other power sources

12. What are the advantages of tidal energy?

- Tidal energy does not produce any pollution.
- It does not use any fuel and does not produce any waste.
- Tides are predictable, so tidal energy can be produced at any time.
- Water is denser than air and therefore can generate electricity at lower speeds than wind turbines.

13. What are the sources of e-wastes?

- Electronic devices: Computers, laptops, mobile phones, printers, monitors, televisions, DVD players, calculators, toys, sport equipments, etc.

- ✦ Household electrical appliances: Refrigerators, washing machine, microwave oven, mixer, grinder, water heater, etc.
- ✦ Accessories: Printing cartridges, batteries and chargers.

14. What are the environmental impact of e-wastes?

- ✦ Disposal of any kind of electrical and electronic devices without knowledge can become the landfill and water pollutants.
- ✦ Electronic equipments contain many hazardous heavy metals such as lead, cadmium that can cause severe soil and groundwater pollution.
- ✦ E-waste dumping yards and the places nearby are polluted and cause severe health hazard.

15. What are the sources of sewage/wastewater?

- ✦ Domestic purpose or household activities
- ✦ Dye and textile industries
- ✦ Leather industries
- ✦ Sugar and breweries industries
- ✦ Paper and pulp industries

16. Give some examples for recycling of wastes.

- ✦ Papers from old books, magazines and newspapers are recycled to produce papers in paper mills.
- ✦ Agricultural wastes like coconut shells, jute cotton stalk, bagasse of sugarcane can be used to make paper and hard board. Paddy husk can be used as livestock fodder.
- ✦ Cowdung and other organic wastes can be used in gobar gas plant to provide biogas and manure for fields.

17. Why does Mathura oil refinery pose problems to the Taj Mahal?

Mathura oil refinery releases many air pollutants such as sulphur dioxide in and around Agra. Sulphur dioxide (SO_2) reacts with water in the atmosphere to forms sulphuric acid (H_2SO_4). This acid destroy the marble quality and the colour of Taj Mahal.

18. Name six basins identified as areas for shale gas exploration in India.

i) Cambay (Gujarat)
ii) Assam-Arakan (North East)
iii) Gondwana (Central India)
iv) Krishna Godavari onshore (East Coast)
v) Cauvery onshore and
vi) Indo-Gangetic basins.

Additional – Long answer question (5 mark)

1. Describe the important measures taken for conservation of forests.

The important measures taken for conservation of forests are as follows

- ✦ **Afforestation :** Activities for afforestation programme (Van Mahotsav) includes planting and protecting trees with multiple uses which help in restoration of green cover. Destruction of trees should be curtailed.
- ✦ **Social forestry programme :** It should be undertaken on a large scale with active participation of the public and utilization of common land to produce firewood, fodder and timber for the benefit of the rural community. This relieves pressure on existing forests and to safeguard future of tribals.
- ✦ **Forest Conservation through Laws :** Adopting stringent laws and policies to conserve and protect forests are through National Forest Policy, (1952 and 1988) and Forest Conservation Act, 1980.

2. What are the main aims of wildlife management?

The main aim of wildlife conservation are:

- ✦ To control and limit exploitation of species.
- ✦ To preserve the plants and animals from extinction.
- ✦ Maintenance of threatened species and protect species which are on the verge of extinction.
- ✦ Preserve the endangered species.
- ✦ To study the ecological relationship of the plants and animals in natural habitat.

- ✦ Hunting and poaching should be prohibited.
- ✦ Establishment of National parks, Wildlife sanctuaries, protected areas and Biosphere reserves.

3. What are the objectives or provisions of the Wildlife Protection Act 1972?

- ✦ Prohibit killing and hunting of specified animals.
- ✦ Constitute sanctuaries, national parks, and closed areas for wildlife conservation.
- ✦ Special schemes for preservation of endangered species.
- ✦ Constitute Central Zoo Authority and recognition of zoos.
- ✦ Restrict, regulate or prohibit trade in wild animals and products obtained from them.

4. What are the differences between conventional and non-conventional energy resources?

S.No.	Conventional Energy Resources	Non–conventional Energy Resources
1	They are obtained from fixed reserves in nature.	They are available in unlimited amount in nature.
2	They are non-renewable i.e. they cannot renew themselves over a short period of time.	They are renewable i.e. renewed over a short period of time.
3	They are exhaustible.	They are inexhaustible.
4	They cause pollution.	They are pollution free.
5	They are expensive to be maintained, stored and transmitted.	They are less expensive.
6	Examples : ✦ Coal ✦ Petroleum ✦ Natural gas and ✦ Nuclear power.	Examples : ✦ Biofuel ✦ Biomass energy ✦ Geothermal energy ✦ Water energy (hydroelectric energy and tidal energy) ✦ Solar energy ✦ Wave energy and ✦ Wind energy.

5. a) What are Fossil Fuels ?

Fossil fuels are natural fuel such as petroleum, coal and natural gas, formed in the geological past from the remains of living organisms.

b) How are fossil fuels formed in the earth?

Fossil fuels, found inside the earth's crust, are formed by natural process, such as anaerobic decomposition of buried dead organisms.

c) How long does fossil fuel take to form?

The formation of fossil takes over millions of years.

d) What conditions helped fossil fuels to form?

Heat and pressure produced by the accumulating sediment layers gradually transform the remains of the organisms into hydrocarbons. e.g. Petroleum, Coal and Natural gas.

6. Describe the steps to be taken to conserve coal and petroleum resources.

It is necessary to conserve or save coal and petroleum resources for the future use, which can be done by reducing their consumption.

- ✦ If electricity is saved, it will in turn reduce the use of coal.
- ✦ Using bicycle for covering short distances instead of using cars, scooters or motorcycles.
- ✦ Using pressure cooker can reduce the consumption of kerosene and LPG while cooking food. Solar cooker and solar heaters can be used wherever possible.
- ✦ Motor vehicles should be designed with fuel efficient engines to increase efficiency and also reduce air pollution.

7. What are the advantages of solar energy sources?

- ✦ It is available in abundance in our country and is free of cost.
- ✦ It is a renewable source of energy.
- ✦ It can be used for generating electricity or heat.
- ✦ It does not cause pollution.
- ✦ Solar panels can be installed in remote and inaccessible areas (forests and hilly regions).

8. What are measures can be taken even at home and school to save electricity?

- ✦ Use energy efficient appliances to save electricity like Compact Fluorescent Lamps (CFL), Light Emiting Diode (LED) bulbs and other electric equipments.
- ✦ Switch off the lights and fans, television and other electrical appliances when not in use.
- ✦ Switch of the mobile phone chargers when not in use.
- ✦ Maximise the use of solar radiation. Solar water heating system can be used instead of electric geysers.
- ✦ Minimise the use of air conditioners.

9. Describe the sewage/wastewater treatment method.

The conventional wastewater treatment methods involve the following steps.

- ✦ **Pre-screening :** Wastewater generated from domestic and industrial activities is screened to remove soil and solid particulates.
- ✦ **Aeration :** Screened wastewater is then pumped to an aeration tank. Here the microbial contaminants are removed by the biological degradation that occurs in the presence of air.
- ✦ **Sludge Management :**
  - i) **Sedimentation process :** In this process, the solid particles in suspension form are allowed to settle. The particles that settle out from the suspension is known as sludge.
  - ii) **Sludge removal :** The sludge generated by the degradation process is transferred periodically from the tank for safe disposal.
- ✦ **Disinfection :** Chlorination and ultraviolet (UV) radiation of treated water is required to remove any microorganism contamination.
- ✦ **Water recycling :** The water will then be supplied for domestic or industrial purposes.

10. What are the health effects of E- Wastes?

- ✦ **Lead :** Damages central and peripheral nervous system; affect brain development in children.
- ✦ **Chromium :** Asthmatic bronchitis.
- ✦ **Cadmium :** Accumulates in kidney and liver; neural damage.
- ✦ **Mercury :** Chronic damage to brain and respiratory system.
- ✦ **Plastics including Polyvinyl Chloride (PVC) :** Burning produces dioxin which can cause developmental and reproductive problems, damages the immune system.

Important abbreviations to remember

IBWL	Indian Board for Wild Life
WWF	World Wildlife Fund
WCN	World Conservation Union
IUCN	International Union for Conservation of Nature and Natural Resources
CITES	Convention of International Trade in Endangered Species
LPG	Liquified Petroleum Gas
PVC	Polyvinyl Chloride
E–wastes	Electronic wastes
CFL	Compact Fluorescent Lamps
LED	Light Emiting Diode
WPSI	Wildlife Protection Society of India

Important years to remember

Wildlife Protection Act	1972
Launch of Project Tiger	1973
Launch of Project Elephant	1992
Launch of Crocodile Conservation Project	1976
Launch of Sea Turtle Conservation Project	1999
National Forest Policy	1952 and 1988
Forest Conservation Act	1980
Chipko Movement	1973

UNIT TEST - 22

Time : 1.15 Hrs. Marks : 50

I. Choose the best answer

(5 × 1 = 5)

1. **The gas released from vehicles exhaust are**
   i) Carbon monoxide ii) Sulphur dioxide iii) Oxides of nitrogen
   a) (i) and (ii) b) (i) and (iii) c) (ii) and (iii) d) (i), (ii) and (iii)
2. **Soil erosion is more where there is**
   a) no rainfall b) low rainfall c) rainfall is high d) none of these
3. **Global warming will cause**
   a) raise in level in oceans b) melting of glaciers c) sinking of islands d) all of these
4. **The Chipko movement was started in the year _____.**
   a) 1970 b) 1973 c) 1980 d) 1983
5. **Jim Corbett National Park (India's first National Park) is located in _____.**
   a) West Bengal b) Assam c) Uttarakhand d) Uttar Pradesh

II. Fill in the blanks

(5 × 1 = 5)

6. Deforestation leads to _____ in rainfall.
7. _____ is the most commonly used fuel for the production of electricity.
8. _____ is a biosphere reserve in Tamilnadu.
9. The destruction of large area of forests is known as _____.
10. WPSI stands for _____.

III. State whether the statements are true or false. Correct the false statement

(5 × 1 = 5)

11. Biogas is a fossil fuel.
12. Habitat destruction cause loss of wild life.
13. Wild life protection act was established in 1972.
14. Non – renewable energy resources are available in unlimited amount in nature.
15. India is the third largest consumer of crude oil in the world, after the United States and China.

IV. Match the following

(5 × 1 = 5)

16.	Bio gas	(a)	Energy saving
17.	Solid waste	(b)	Non–renewable energy
18.	Natural gas	(c)	Lead and heavy metals
19.	Green house gas	(d)	Renewable energy

20. CFL bulbs (e) CO_2

V. Assertin and Reasoning

(5 × 1 = 5)

Direction: In each of the following questions, a statement of Assertion is given and a corresponding statement of Reason is given just below it. Of the statements given below, mark the correct answer as

a. If both A and R are true and R is the correct explanation of A.
b. If both A and R are true but R is not the correct explanation of A.
c. If A is true but R is false.
d. If both A and R are false.

21. **Assertion:** Energy efficient bulbs like CFL must be used to save electric energy.
    Reason: CFL bulbs are costlier than ordinary bulbs, hence using ordinary bulbs can save our money.
22. **Assertion:** Rainwater harvesting is to collect and store rain water.
    Reason: Rainwater can be directed to recharge the underground water source.
23. **Assertion:** Forests contribute to the economic development of our country.
    Reason: They provide wood, food, fodder, fibre and medicine.
24. **Assertion:** Fossil fuels are formed by anaerobic decomposition of buried dead organisms, over millions of years.
    Reason: Heat and pressure produced by sediment layers transform the remains of the organisms into hydrocarbons.
25. **Assertion:** Coal and Petroleum are bio-fuels.
    Reason: Coal and Petroleum are formed by the decomposition of animal wastes (cow dung) and plant wastes.

VI. Write the answer for the following questions in word or sentence

(5 × 1 = 5)

26. What are the agents of soil erosion?
27. How are e–wastes generated?
28. What would happen if the habitat of wild animals is disturbed?
29. Define Soil Erosion.
30. What is shale gas?

VII. Write the short answer for ANY 5 of the following questions

(5 × 2 = 10)

31. What is the importance of rainwater harvesting?
32. What are the consequences of deforestation?
33. What are the advantages of using biogas?
34. What is Deforestation? Why does it happen?
35. Write a note on Chipko movement.
36. What are the uses of Petroleum?
37. What are the uses of biogas?

VIII. Write long answer for the following questions

(2 × 5 = 10)

38. How will you prevent soil erosion?

    or

    Enumerate the importance of forest.
39. How does rain water harvesting structure recharge ground water?

    or

    What are the differences between conventional and non-conventional energy resources?

❧❖❧