

### Ozone Layer

Three molecules of oxygen combine to form ozone. Ozone layer is found in stratosphere. It acts as a ozone shield and protects earth from harmful effects of ultraviolet radiation. However many man-made components like CFCs (Chlorofluorocarbons) reacts with ozone releasing molecular oxygen, causing ozone depletion. Depletion of ozone layer thickness is called **ozone hole**.

### MANAGEMENT OF NATURAL RESOURCES

- Controlling system for the use of natural resources in such a way as to avoid their wastage and to use them in the most effective way is called **management of natural resources**.

**The Reasons to Manage our Natural Resources are :**

- The proper management can ensure that the natural resources are used judiciously so that to fulfil the needs of present generation and also last for the generations to come.
- The proper management of natural resources takes into consideration long-term perspective (or view) and prevents their exploitation.

- (iii) The proper management can ensure equitable distribution of natural resources so that all the people can benefit from the development of these resources.
- (iv) The three R's to save the environment are Reduce, Recycle and Reuse.

## **GANGA ACTION PLAN**

Ganga (Ganges) along with its tributaries is the largest river system of India. Over the years, the river has been grossly misused. Cities and towns along the banks of the river had been discharging some 1000 million (1 billion) litres of untreated sewage. Thousands of industries had been pouring their untreated effluents into the river.

The result was that BOD of the river had risen to 9.7 mg/l (48.9 mg/l at Hardwar in 2007-2008) instead of the maximum of 2mg/l. Pollution load and toxicity had started killing of fish in large sections of the river. Ganga Action Plan (GAP) was formulated to reduce pollution load of river Ganga by more than 75%. The water quality has been tested from time to time by checking coliform (group of harmless bacteria in human intestine) number/100 ml.

### **The Important Aspect of GAP**

- (1) Diversion of sewers away from river
- (2) Treatment of sewage and changing it into an energy source
- (3) Construction of community toilets.
- (4) Development of solid waste management system
- (5) Enforcement of setting up of effluent treatment plants by the industry.

## **FOREST AND WILD LIFE**

Forests are vast areas, located far away from human inhabitation where wild plants of various kinds grow and animals of different varieties live without the intervention of humans.

- One of the main aims of conservation is to try and preserve the biodiversity we have in-

herited. Experiments and field studies suggest that a loss of diversity may lead to a loss of ecological stability.

### **To Consider the Conservation of Forests, We Need to Look at the Stakeholders who are :**

- (i) The people who live in or around forests, are dependent on forest products for various aspects of their life.
- (ii) The Forest Department of the Government which owns the land and controls the resources from forests.
- (iii) The industrialists – from those who use ‘tendu’ leaves to make bidis to the ones with paper mills – who use various forest produce.
- A major programme called **silviculture** has been started to replenish the forests by growing more trees and plants.

### **The Silviculture Programme has Many Advantages**

- (i) It produces a large quantity of raw materials for industry (like timber and paper industry).
- (ii) It increases the area of earth under forests (which is good for the conservation of wildlife).
- (iii) It maintains a perfect water cycle in nature.

### **Steps for Conservation of Energy Resources are**

- (i) Use energy efficient electrical appliances to save electricity.
- (ii) Use solar cookers.
- (iii) Encourage the use of biogas as domestic fuel.
- (iv) Fuel efficient motor vehicle should be designed to reduce consumption of petrol and diesel.
- (v) The harnessing of water resources by building dams has social, economic and environmental implications. These are local-specific and may be developed so as to give local people control over their local resources.
- (vi) The fossil fuels, coal and petroleum, will ultimately be exhausted. Because of this and

because their combustion pollutes our environment, we need to use these resources judiciously.

**Rain water harvesting** is an age-old practice in India. Water-harvesting techniques used depend on the location where it is to be used.

### **Various Advantages of Water Stored in the Ground**

- (i) The water stored in ground does not evaporate.
- (ii) The water stored in ground spreads out to recharge wells and provides moisture for crops over a wide area.
- (iii) The water stored in ground does not promote breeding of mosquitoes (unlike stagnant water collected in ponds or artificial lakes).
- (iv) The water stored in ground is protected from contamination by human and animal wastes.

<b>Exercise</b>	
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**DIRECTIONS :** This section contains multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) out of which only one is correct.

1. Cycling of elements in an ecosystem is called
  - (a) chemical cycle
  - (b) geochemical cycle
  - (c) biogeochemical cycle
  - (d) geological cycle
2. If there was no  $\text{CO}_2$  in the earth's atmosphere, the temperature of earth's surface would be
  - (a) as such
  - (b) less than the present level
  - (c) increase from present level
  - (d) dependent upon oxygen amount of the environment
3. Green house effect is due to the presence of
  - (a) ozone layer in the atmosphere
  - (b) infrared light reaching the earth
  - (c) moisture layer in the atmosphere
  - (d)  $\text{CO}_2$  layer in the atmosphere
4. The pollution in city like Delhi may be controlled to great extent
  - (a) by proper sewage and proper exit of chemicals from factories
  - (b) by wide roads and factories away from the city
  - (c) by cleaning city and scanty use of pesticides
  - (d) All of the above
5. Living things constitute the biotic component of the biosphere and the abiotic component consists of
  - (a) air, water and soil
  - (b) oceans, land and mountains
  - (c) sunlight, oxygen and carbon dioxide
  - (d) All of these
6. Fixation of carbon dioxide in our atmosphere takes place by
  - (a) conversion of carbon dioxide into glucose by green plants in presence of sunlight



- (b) many marine animals use carbonates dissolved in sea water to make their shells
  - (c) Both (1) and (2)
  - (d) fire fighting operations in forests
7. Average temperature on earth remains fairly steady because
- (a) the atmosphere slows down the escape of heat into outer space during night.
  - (b) the atmosphere prevents the sudden increase in temperature during day time.
  - (c) air is a bad conductor of heat.
  - (d) All of these
8. The stratospheric ozone depletion leads to
- (a) global warming
  - (b) increase in the incidence of skin cancers
  - (c) forest fires
  - (d) All the above
9. Biological Oxygen Demand (BOD) is a measure of
- (a) industrial wastes poured into water bodies.
  - (b) extent to which water is polluted with organic compounds.
  - (c) amount of carbon monoxide inseparably combined with haemoglobin.
  - (d) amount of oxygen needed by green plants during night.
10. Recent reports of acid rain in some industrial cities are due to the effect of atmospheric pollution by
- (a) excessive release of  $\text{CO}_2$  by burning of fuels like wood and charcoal, cutting of forests and increased animal population.
  - (b) excessive release of  $\text{NO}_2$  and  $\text{SO}_2$  in atmosphere by burning of fossil fuel.
  - (c) excessive release of  $\text{NH}_3$  by industrial plants and coal gas.
  - (d) excessive release of CO in atmosphere by incomplete combustion of coke, charcoal and other carbonaceous fuel.

11. Photochemical smog formed in congested metropolitan cities mainly consists of
  - (a) ozone, peroxyacetyl nitrate and  $\text{NO}_x$
  - (b) smoke, peroxyacetyl nitrate and  $\text{SO}_2$
  - (c) hydrocarbons,  $\text{SO}_2$  and  $\text{CO}_2$
  - (d) hydrocarbons, ozone and  $\text{SO}_x$
12. Besides uneven heating of atmosphere in different regions of the earth, other factors resulting in diverse atmospheric phenomenon are
  - (a) rotation of the earth and mountain ranges coming in the paths of the winds.
  - (b) water vapours formed due to excessive heat get into air.
  - (c) air expands and cools as it rises up carrying the water vapours with it.
  - (d) All of these
13. Presence of high level of pollutants in atmosphere during cold weather lead to formation of
  - (a) fog
  - (b) acid rains
  - (c) smog
  - (d) All of these
14. All organism require water to stay alive because
  - (a) all cellular processes take place in a water medium.
  - (b) biochemical reactions inside the body take place in aqueous medium.
  - (c) substances are transported from one part of the body to other parts in a dissolved form.
  - (d) All of these
15. Sustainability and diversity of life is dependent on
  - (a) availability of water alone
  - (b) not only temperature, nature of soil but also the availability of water
  - (c) nature of soil
  - (d) temperature
16. Soil conservation is the process where
  - (a) sterile soil is converted to fertile soil
  - (b) soil is aerated
  - (c) soil erosion is allowed
  - (d) soil is protected against loss

17. Nitrogen cycle involves bacteria capable of changing proteins to ammonia called as
  - (a) bacteria of decay
  - (b) denitrifying bacteria
  - (c) nitrogen fixing bacteria
  - (d) ammonifying bacteria
18. Phosphorus cycle is
  - (a) gaseous cycle
  - (b) perfect cycle
  - (c) imperfect cycle
  - (d) partly gaseous and partly sedimentary
19. Nitrogen content of biosphere remains constant due to
  - (a) nitrogen fixation
  - (b) nitrogen cycle
  - (c) industrial pollution
  - (d) absorption of nitrogen
20. Breaking down of rocks at or near the surface of the Earth by various physical, chemical or biological processes results in the formation of \_\_\_\_\_.
  - (a) nutrients
  - (b) soil
  - (c) minerals
  - (d) water
21. Expansion of certain parts of rocks due to heat during the day and contraction at night lead to
  - (a) formation of cracks in the rocks
  - (b) breaking of rocks
  - (c) formation of cracks and ultimately the huge rocks breaking into smaller pieces
  - (d) formation of soil directly
22. Water is helpful in formation of soil as
  - (a) it enters into the cracks formed due to uneven heating and then freezes inside the rocks.
  - (b) flowing water wears away even hard rocks.
  - (c) fast flowing water crushes big and small rocks into smaller particles while flowing downstream.
  - (d) All of these



23. Besides water \_\_\_\_\_ also erode rocks down and carry sand from one place to other.
  - (a) the sun
  - (b) strong winds
  - (c) living organism
  - (d) plants
24. Conservation is
  - (a) protection of natural resources
  - (b) management of natural resources
  - (c) proper use of natural resources
  - (d) All the above
25. Largest amount of fresh water is found in
  - (a) lakes and streams
  - (b) underground
  - (c) polar ice and glaciers
  - (d) rivers
26. The major factor in causing global warming is
  - (a) increase in oxygen concentration in atmosphere.
  - (b) decrease in carbon dioxide concentration in atmosphere.
  - (c) increase in carbon dioxide concentration in atmosphere.
  - (d) decrease in atmospheric nitrogen.
27. The major source(s) of carbon for living things is/are
  - (a) coal, oil, and natural gas
  - (b) plants
  - (c) CO<sub>2</sub> in the atmosphere and oceans
  - (d) methane in the atmosphere
28. Lichens while growing on the surface of rocks release certain substances
  - (a) that erodes the rock surface to powder
  - (b) that enters into the cracks
  - (c) that grows into more organisms
  - (d) None of these
29. The type of soil is decided by the average size of particles, but the quality of soil is decided by
  - (a) uantity of particles
  - (b) amount of humus
  - (c) microscopic organisms

- (d) amount of humus and the microscopic organisms found in it
30. Humus is a major factor in deciding soil structure because
- soil becomes more porous
  - allows water and air to penetrate deep underground
  - Both (1) and (2)
  - None of these
31. Soil pollution is
- removal of useful components or addition of harmful ingredients.
  - adversely affecting fertility of soil.
  - killing the diversity of organism that live in it.
  - All of these
32. Adding iron to the ocean might
- cause algal blooms, thus reducing levels of atmospheric carbon dioxide
  - increase the productivity of the oceans, providing more food for people
  - upset the balance within this delicate ecosystem
  - All of these are correct
33. Soil erosion can be prevented by
- afforestation
  - deforestation
  - overgrazing
  - removal of vegetation
34. Which of the following is not the function of forest ?
- It is used to make paper.
  - Resin, gum and drugs are obtained.
  - Controls flood.
  - Causes soil erosion.
35. Which of the following bacteria is found in Ganga water ?
- Coliform bacteria
  - Streptococcus* bacteria
  - Staphylococcus* bacteria
  - Diplococcus* bacteria
36. Pick the most appropriate statement.

- (a) Soil erosion cannot be prevented by the roots of plants.
  - (b) Bare topsoil provides space for vegetation.
  - (c) Vegetative cover on the ground helps in percolation of water into deeper layers.
  - (d) Large scale deforestation limits biodiversity.
37. Water cycle gets complicated because
- (a) water dissolves many minerals and nutrients.
  - (b) some of the water that falls as rain seeps into the soil and become part of underground reservoir of fresh water.
  - (c) water is used by terrestrial animals and plants for carrying their life processes.
  - (d) Both (2) and (3)
38. Many molecules essential to life like proteins, nucleic acids and vitamin or biologically essential compounds like alkaloids and urea contain
- (a) nitrogen
  - (b) hydrogen
  - (c) oxygen
  - (d) water
39. Nitrogen fixing bacteria are usually found in
- (a) soil
  - (b) atmosphere
  - (c) some species of dicot plants and the root-nodules present in the roots of legumes
  - (d) None of these
40. Which of the following will be released during combustion of fossil fuels ?
- (a) Carbon dioxide
  - (b) Oxide of nitrogen
  - (c) Carbon monoxide
  - (d) All of these
41. Biodiversity hotspots are
- (a) oceans
  - (b) glaciers
  - (c) rivers
  - (d) forests
42. Van Mahotsava is meant for
- (a) afforestation
  - (b) deforestation
  - (c) start of grazing season

- (d) commercial forestry
- 43. Kulhs are irrigation canals of
  - (a) Rajasthan
  - (b) Bihar
  - (c) Himachal Pradesh
  - (d) Karnataka
- 44. Bacteria in the soil converts the various compounds of nitrogen present in the dead bodies of plants and animals back to
  - (a) nitrogen
  - (b) proteins
  - (c) nitrates and Nitrites
  - (d) living organisms
- 45. Plants utilise carbon dioxide from atmosphere in presence of sunlight to produce glucose during the process of photosynthesis. On the other hand carbon dioxide is released into atmosphere by the living things during
  - (a) industrialization
  - (b) respiration
  - (c) combustion
  - (d) both respiration and combustion
- 46. The three R's referred to in context to save environment are
  - (a) Reduce, Recycle and Reuse
  - (b) Refuse, Reduce and Reuse
  - (c) Remain, Relent and Repent
  - (d) Reinforce, Repair and Render
- 47. Recycling of waste materials involve the steps of
  - (a) collecting all the waste material and bury under the soil.
  - (b) segregating the bio-degradable and non-biodegradable material to dispose separately.
  - (c) extracting fresh plastic, paper, glass or metal from waste material.
  - (d) Both (2) and (3)
- 48. The most appropriate definition of a natural resource is that it is a substance/commodity that is
  - (a) present only on land.
  - (b) a gift of nature which is very useful to mankind.

- (c) a man-made substance placed in nature.
  - (d) available only in the forest.
49. The important message conveyed by the 'Chipko Movement' is
- (a) to involve the community in forest conservation efforts.
  - (b) the ignore the community in forest conservation efforts.
  - (c) to cut down forest trees for development activities.
  - (d) government agencies have the unquestionable right to order destruction of trees in forests.
50. Khadins, Bundhis, Ahars and Kattas are ancient structures that are examples for
- (a) grain storage
  - (b) wood storage
  - (c) water harvesting
  - (d) soil conservation
51. Given below are a few statements related to biodiversity. Pick those that correctly describe the concept of biodiversity.
- (i) Biodiversity refers to the different species of flora and fauna present in an area.
  - (ii) Biodiversity refers to only the flora of a given area.
  - (iii) Biodiversity is greater in a forest.
  - (iv) Biodiversity refers to the total number of individuals of a particular species living in an area.
- (a) (i) and (ii)
  - (b) (ii) and (iv)
  - (c) (i) and (iii)
  - (d) (ii) and (iii)
52. We are getting a large number of items for daily consumption in disposable packing. Is it possible to save environment by not throwing them immediately after use?
- (a) Yes, they can be used to store things in the kitchen

- (b) Yes, we can use our innovative ideas to utilize them
  - (c) Yes, we can give them to others who are in need of them
  - (d) All of these
53. Ignorance of local knowledge and local needs in forest management practices has led to
- (a) conversion of vast tracts of forests to mono culture of pine, teak and eucalyptus
  - (b) extinction of wild life and several species
  - (c) Both (1) and (2)
  - (d) None of these
54. Construction of big dams, though useful still draws flak from society
- (a) displacement of large number of peasants and tribes without compensation lead to social problems.
  - (b) expenditure of huge amounts of public money without proportional benefits cause economic problems.
  - (c) deforestation and loss of biodiversity result in environmental problems.
  - (d) All of these
55. Increased fuel efficiency and reduced air pollution can be affected by ensuring
- (a) complete combustion in internal combustion engines
  - (b) avoiding use of machines
  - (c) adhering to emission norms in automobiles but ignoring elsewhere
  - (d) All of these
56. Among the statements given below select the ones that correctly describe the concept of sustainable development.
- (i) Planned growth with minimum damage to the environment.
  - (ii) Growth irrespective of the extent of damage caused to the environment.
  - (iii) Stopping all developmental work to conserve the environment.
  - (iv) Growth that is acceptable to all the stakeholders.



- (a) (i) and (iv)
  - (b) (ii) and (iii)
  - (c) (ii) and (iv)
  - (d) (iii) only
57. In our country, there are attempts to increase the height of several existing dams like Tehri and Almati, dams across Narmada.
- Choose the correct statements among the following that are a consequence of raising the height of dams
- (i) Terrestrial flora and fauna of the area is destroyed completely.
  - (ii) Dislocation of people and domestic animals living in the area.
  - (iii) Valuable agricultural land may be permanently lost.
  - (iv) It will generate permanent employment for people.
- (a) (i) and (ii)
  - (b) (i), (ii) and (iii)
  - (c) (ii) and (iv)
  - (d) (i), (iii) and (iv)
58. It is important to make small check dams across the flooded gullies because they
- (i) hold water for irrigation.
  - (ii) hold water and prevent soil erosion.
  - (iii) recharge ground water.
  - (iv) hold water permanently.
- (a) (i) and (iv)
  - (b) (ii) and (iii)
  - (c) (iii) and (iv)
  - (d) (ii) and (iv)
59. The term "water-pollution" can be defined in several ways. Which of the following statements does not give the correct definition ?
- (a) The addition of undesirable substances to water-bodies.
  - (b) The removal of desirable substances from water-bodies.
  - (c) A change in pressure of the water bodies.
  - (d) A change in temperature of the water bodies.

60. The laws, rules and regulations will be more effective in allowing everyone reap the benefits of development
  - (a) if we adjust our requirement individually
  - (b) if we adjust our requirement collectively
  - (c) if we adjust our requirement both individually and collectively
  - (d) even if we do not adjust our requirements
61. Seniors usually ask you to switch off fans and light while going out. Which 'R' is being suggested by them?
  - (a) Reduce
  - (b) Repair
  - (c) Render
  - (d) Refuse
62. Management of resources has become necessary so that
  - (a) the resources are used with long term perspectives.
  - (b) the resources are distributed equitably between rich and poor.
  - (c) the wastes are disposed in safe and environment-friendly manner.
  - (d) All of these
63. Forests are far away from the cities and we hardly ever visit them, still they are important as
  - (a) many resources are available in the forests.
  - (b) bio-diversity in the forests help in maintaining ecological balance.
  - (c) local people use the forests for grazing their animals.
  - (d) those listed above are just a few advantages of forests.
64. Loss of vegetation cover, diversion for high water demanding crops, pollution from industrial effluents and urban wastes have resulted in
  - (a) non-sustainability of water availability underground
  - (b) unpredictable rainfall
  - (c) neglect of local irrigation methods
  - (d) frequent floods
65. Large dams are found to be useful as
  - (a) they ensure storage of water for irrigation.
  - (b) generation of electricity.

- (c) development of canal systems to distribute water to far off places.
  - (d) All of these
66. The process of nitrogen-fixation by bacteria does not take place in the presence of
- (a) molecular form of hydrogen
  - (b) elemental form of oxygen
  - (c) water
  - (d) elemental form of nitrogen
67. Choose the correct sequences
- (a)  $\text{CO}_2$  in atmosphere  $\rightarrow$  decomposers  $\rightarrow$  organic carbon in animals  $\rightarrow$  organic carbon in plants.
  - (b)  $\text{CO}_2$  in atmosphere  $\rightarrow$  organic carbon in plants  $\rightarrow$  organic carbon in animals  $\rightarrow$  inorganic carbon in soil.
  - (c) Inorganic carbonates in water  $\rightarrow$  organic carbon in plants  $\rightarrow$  organic carbon in animals  $\rightarrow$  scavengers.
  - (d) Organic carbon in animals  $\rightarrow$  decomposers  $\rightarrow$   $\text{CO}_2$  in atmosphere  $\rightarrow$  organic carbon in plants.
68. Ozone-layer is getting depleted because of
- (a) excessive use of automobiles.
  - (b) excessive formation of industrial units.
  - (c) excessive use of man-made compounds containing both fluorine and chlorine.
  - (d) excessive deforestation.
69. What happens when rain falls on soil without vegetational cover ?
- (a) Rain water percolates in soil efficiently.
  - (b) Rain water causes loss of surface soil.
  - (c) Rain water leads to fertility of the soil.
  - (d) Rain water does not cause any change in soil.
70. International and national laws and regulations regarding environment and resources are being formulated for
- (a) sustenance of resources
  - (b) conservation of environment
  - (c) increased awareness about the problems
  - (d) All of these

## Hints & SOLUTIONS —

1. (c)
2. (b)
3. (d)
4. (d)
5. (a) Living things constitute the biotic component of the biosphere and the abiotic component consists of air, water and soil.
6. (c) Fixation of carbon dioxide in our atmosphere takes place by conversion of carbon dioxide into glucose by green plants in presence of sunlight and also by use of carbonates dissolved in sea water by some marine animals to make their shells.
7. (d) Average temperature on earth remains fairly steady because air is a bad conductor of heat. The atmosphere slows down the escape of heat into outer space during night and prevents the sudden increase in temperature during day time.
8. (d)
9. (b)
10. (b)
11. (b)
12. (d) Besides uneven heating of atmosphere in different regions of the earth, other factors resulting in diverse atmospheric phenomenon are: Rotation of the earth and mountain ranges coming in the paths of the winds; Water vapours formed due to excessive heat get into air; and Air expands and cools as it rises up carrying the water vapours with it.
13. (c) Presence of high level of pollutants in atmosphere during cold weather leads to formation of smog.
14. (d) All organism require water to stay alive because all cellular processes and biochemical reactions take place in a water medium. Transportation of substances from one part of the body to other parts is in a dissolved form.
15. (b) Sustainability and diversity of life is dependant on not only temperature, nature of soil but also the availability of water.
16. (d)
17. (d)
18. (c)
19. (b)


20. (b) Breaking down of rocks at or near the surface of the Earth by various physical, chemical or biological processes results in the formation of soil.
21. (c) Expansion of certain parts of rocks due to heat during the day and contraction at night lead to formation of cracks and ultimately the huge rocks breaking into smaller pieces.
22. (d) Water is helpful in formation of soil as it enters into the cracks formed due to uneven heating and then freezes inside the rocks. Flowing water wears away even hard rocks and fast flowing water crushes big and small rocks into smaller particles while flowing downstream.
23. (b) Besides water, strong winds also erode rocks down and carry sand from one place to other.
24. (d)
25. (c)
26. (c)
27. (c)
28. (a) Lichens while growing on the surface of rocks release certain substances that erode the rock surface to powder.
29. (d) The type of soil is decided by the average size of particles, but the quality of soil is decided by the amount of humus and microscopic organisms found in it.
30. (c) Humus is a major factor in deciding soil structure because soil becomes more porous and allows water and air to penetrate deep underground.
31. (d) Soil pollution is caused due to removal of useful components or addition of harmful ingredients adversely affecting fertility of soil. Killing the diversity of organism that live in it also affects the fertility of land.
32. (d)
33. (a)
34. (d)
35. (a)
36. (d) Large scale deforestation limits biodiversity.
37. (d) Water cycle gets complicated because some of the water that falls as rain seeps into the soil and become part of underground reservoir of fresh water and also water is used by terrestrial animals and plants for carrying their life processes.



38. (a) Many molecules essential to life like proteins, nucleic acids and vitamin or biologically essential compounds like alkaloids and urea contain nitrogen.
39. (c) Nitrogen fixing bacteria are usually found in some species of dicot plants and the root-nodules present in the roots of legumes.
40. (d)
41. (d)
42. (a)
43. (c)
44. (c) Bacteria in the soil converts the various compounds of nitrogen present in the dead bodies of plants and animals back to nitrates and nitrites.
45. (d) Plants utilise carbon dioxide from atmosphere in presence of sunlight to produce glucose during the process of photosynthesis. On the other hand carbon dioxide is released into atmosphere by the living things during respiration and combustion.
- 46 (a) The three R's referred to in context to save environment are: Reduce, Recycle and Reuse. The resources can be conserved by implementing these three R's.
47. (d) Recycling of waste materials includes extraction of all possible items that can be reused and also to dispose the biodegradable waste in a meaningful manner.
48. (b)
49. (a)
50. (c)
51. (c)
- 52 (d) We are humans capable of thinking and can always find purposeful ways of utilizing waste materials irrespective of their being biodegradable or non biodegradable.
53. (c) Ignorance of local knowledge and local needs in forest management practices has led to growth of similar plants which in turn has affected the habitat.
54. (d) Construction of big dams require huge water reservoirs to store water necessitating displacement of local habitat. Poor selection of site can put extra pressure on the exchequer.



- 55. (a) Complete combustion in internal combustion engines will not increase the fuel efficiency but also reduce formation of carbon monoxide.
- 56. (a)
- 57. (b)
- 58. (b)
- 59. (3)
- 60. (c) The laws, rules and regulations will be more effective only if we all comply to their provisions.
- 61. (a) One can reduce consumption of energy resources by switching off fans and light while going out.
- 62. (d) Management of resources has become necessary so that the resources available to all in the present or future generations.
- 63. (d)
- 64. (a) Loss of vegetation cover, diversion for high water demanding crops, pollution from industrial effluents and urban wastes is leading to contamination and depletion of water table.
- 65. (d) Large dams are built to generate electricity by converting the potential energy of stored water into kinetic energy to rotate the turbines of generator. The water is canalised through canals.
- 66. (b)
- 67. (b)
- 68. (c)
- 69. (b)
- 70. (d) International and national laws and regulations regarding environment and resources are being formulated for sustenance of resources, conservation of environment and increased awareness about the problems so that the future generations are able to fulfil their energy requirements.

<b>Chapter 8</b> 	<h1>Human Welfare Biology</h1> <h2>(Food Resources)</h2>
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### INTRODUCTION

- All living organisms depend on food sources either on plants or animals to fulfil the requirements of proteins, carbohydrates, fats, vitamins and minerals.
- We can increase the production by the development and use of improved varieties with high yield and better agricultural practices.

### AGRICULTURE

- **Green revolution** has increased food grain production while **white revolution** has increased production of milk.
- Cereals, pulses, vegetables, spices and fruits provide carbohydrates, proteins, fats, vitamins and minerals etc.
- Fodder crops like berseem, oats or sudan grass are raised as food for the livestock.

### Based on the Seasons of Cultivation, Crops are Classified in Two Categories

- (i) **Kharif Crops** : Crops grown in rainy season from July to October are kharif crops . Example: Paddy, soyabean, maize, cotton, and green gram etc.
- (ii) **Rabi Crops** : Crops grown in winter season from November to April are rabi crops. Example: Wheat, gram, peas, mustard and linseed etc.
- **For improvement in crop production following practices are involved in farming –**
  - (i) Choice of seeds for planting
  - (ii) Nurturing of crop plants
  - (iii) Protection of growing and harvested crops from loss

### Improving Crop Yields

#### 1. Crop variety improvement

Varieties of crops can be selected by breeding for certain useful characteristics such as disease resistance,

response to fertilisers, product quality and high yield. Two ways of crop variety improvement are

- (i) **Hybridisation:** Crossing between genetically dissimilar plants is hybridization. The crossing may be **intervarietal** (between different varieties), **intergeneric** (between different genera), **interspecific** (between different species of the same genus). The most common type of breeding is intervarietal.
- (ii) **Introducing genes for desired characters** – It gives rise to genetically modified crops.

**The various aspects for which crop variety improvement is carried out are as follows:**

- a. To obtain higher yield of crop.
- b. To enhance the desirable quality of food items.
- c. To produce crop variety that is resistant to biotic and abiotic factors.
- d. To change the maturity duration of crop.
- e. To induce desirable agronomic traits.
- f. **To develop plant varieties with wider adaptability.**

## **2. Crop production management**

In India the money or financial condition of farmers decides the farming practices and agricultural technologies for more production.

## **NUTRIENT MANAGEMENT**

Plant need nutrients for their growth which is supplied by air, water and soil.

Air supplies carbon and oxygen, water supplies hydrogen, soil supplies other 13 nutrients.

Of the six macronutrients, only three namely **NPK (Nitrogen, Phosphorus and Potassium)** are required by plants in greater amounts. They are called **primary nutrients**.

- (i) **Micronutrients:** Nutrients required in small quantities are called micronutrients. *E.g.* Mo, Mn, Cl, Cu, B, Zn, Fe.
- (ii) **Macronutrients:** Nutrients required in larger quantities are called macronutrients. *E.g.* P, Mg, K, N, Ca, S.

## **MANURE AND FERTILIZERS**

1. **Manure:** It is prepared by decomposition of animal excreta and plant waste. Now-a-days we use biological wastes in manure. Based on the kind of biological material used, manure can be classified as –
  - (a) **Compost** – The decomposition of livestock excreta, vegetable waste, animal refuse, domestic waste, sewage waste, straw, weeds in pits is known as composting. It is also prepared by using earthworms to hasten the process of decomposition of plant and animal refuse. This is called **vermi-composting**.
  - (b) **Green manure** – Plants like sunhemp or guar are grown and then mulched by ploughing them into the soil. This is green manure. They provide nitrogen and phosphorus to soil.
2. **Fertilizers:** They commercially produced plant nutrients. They supply nitrogen, phosphorus in higher yields of high cost farming. But continuous use of fertilizers can destroy soil fertility because excess use of fertilizers kill micro-organisms.
3. **Organic farming:** It is a farming system using organic manures, recycled farm-wastes and use of bio-agents such as culture of blue-green algae in preparation of biofertilisers, neem leaves or turmeric specifically in grain-storage as bio-pesticides.

## IRRIGATION

Most agricultural areas in India depend upon monsoons and rainfall during growing season. Various irrigation systems are adopted to supply water to agricultural lands, they are – Wells, canals, rivers, tanks etc. Rain water harvesting and watershed management increases the availability of water.

### Cropping Patterns

- **Mixed cropping:** Growing two or more crops simultaneously on same land is mixed cropping.
- **Inter-cropping:** Growing two or more crops simultaneously on the same field in a definite pattern is inter cropping.

- **Crop-rotation:** Growing of different crops on a piece of land in a pre-planned succession is crop rotation.

## Crop Protection Management

Crops need protection against weeds, insect pests and diseases. Weeds like **Xanthium**, **Parthenium**, **Cyperinus** competes for food, space and light. They take nutrients and reduce the growth of the main crop. Pests are organisms like rats, insects, mites, fungi *etc* that damage or destroy cultivated plants or plant products and make them unfit for human consumption.

Micro-organisms or pathogens cause diseases in crop plants. Pathogens can be bacteria, fungi, or virus. These pathogens are generally transmitted through soil, water, and air.

### **Preventive measures of insect pests and weeds :**

Using pesticides is the most common method used to eradicate weeds, pests, and infectious diseases.

1. **Herbicides** are used to eradicate weeds.
2. **Fungicides** are used to destroy fungus.
3. **Insecticides** are used against insects.

## ANIMAL HUSBANDRY

It is the scientific management of animal livestock in various aspects such as feeding, breeding and disease control. The animal included are cattle, goat, poultry, sheep and fish.

### **1. Cattle farming**

It is done for two purposes-milk and drought labour for agricultural work such as tilling, irrigation and carting. Indian cattle belong to two different species **Bos indicus**, cows and **Bos bubalis**, buffaloes.

### **2. Poultry farming**

They are farmed to produce layers for eggs and broilers for meat. The cross-breeding programmes between Indian and foreign breeds are done for improving the following desirable traits

- (i) Number and quality of chicks.



## Exercise

**DIRECTIONS :** This section contains multiple choice questions. Each question has 4 choices (a), (b), (c) and (d) out of which only one is correct.

1. The best way to increase the yield of wheat in India is
  - (a) to sow seeds of improved varieties.
  - (b) to use tractors.
  - (c) to reduce the quantity of ration consumers.
  - (d) to remove weeds from wheat fields.
2. A plant cell has potential to develop into full plant. This property of the plant cell is called
  - (a) tissue culture
  - (b) totipotency
  - (c) pluripotency
  - (d) gene cloning
3. Cultivation of *Bt* cotton has been much in the news. The prefix "Bt" means
  - (a) "Barium-treated" cotton seeds
  - (b) "Bigger thread" variety of cotton with better tensile strength
  - (c) Production by "biotechnology" using restriction enzymes and ligases
  - (d) Carrying an endotoxin gene from *Bacillus thuringiensis*
4. Fowl grown only for meat is known as
  - (a) hybrid
  - (b) broiler
  - (c) milch
  - (d) bird culture
5. Increase in food production has been possible by the success of
  - (a) green revolution
  - (b) white revolution
  - (c) red revolution
  - (d) green revolution for food grain and white revolution for milk
6. Food security depends upon
  - (a) availability of food
  - (b) access to food
  - (c) both availability of food and access to it
  - (d) government policies only
7. Sustained livelihood can be achieved by use of
  - (a) mixed farming
  - (b) intercropping



- (c) integrated farming practices
- (d) All of these
- 8. Cereals such as wheat, rice, and maize provide us
  - (a) carbohydrates for energy requirement
  - (b) proteins for body building
  - (c) fats
  - (d) All of these
- 9. Pulses such as gram, green gram, pigeon pea and lentil provide us
  - (a) proteins for body building
  - (b) fats
  - (c) carbohydrates for energy requirement
  - (d) All of these
- 10. The term 'aquaculture' means
  - (a) cattle breeding
  - (b) marine fisheries
  - (c) inland fisheries
  - (d) Both (b) and (c)
- 11. First commercial pesticide was
  - (a) DDT
  - (b) 2,4-D
  - (c) Burgandy mixture
  - (d) Bordeaux mixture
- 12. The carnivorous fish *Gambusia*, introduced in the lakes, ponds, etc., control a deadly disease in India, feeds on the larvae of
  - (a) *Nephantis*
  - (b) Dragonfly
  - (c) *Anopheles*
  - (d) All of these
- 13. Fish that eradicates the mosquito larvae, is
  - (a) *Anabus*
  - (b) *Rohu*
  - (c) *Gambusia*
  - (d) *Cutter fish*
- 14. Vitamins and minerals are provided by
  - (a) cereals
  - (b) vegetable, spices and fruits
  - (c) pulses
  - (d) fodder
- 15. Select the least probable statement
  - (a) Photoperiods are related to the duration of sunlight.
  - (b) Different crops require different climatic conditions, temperature and photoperiods for their growth and completion of life cycle.

- (c) Crops grown in rainy season are called the kharif crops.
- (d) Mustard, linseed and peas are grown in kharif season.
16. The activities for improving crops yields are
- crop variety improvement
  - crop production improvement
  - crop production management
  - All of these
17. Hybridization
- is done to incorporate desirable characteristics into crop varieties.
  - refers to crossing between genetically dissimilar plants.
  - may be intervarietal or interspecific.
  - All these statements are correct.
18. Variety improvement is done to get higher yield not only by making it tolerant to high salinity or diverse climatic conditions, but also
- to increase resistance to biotic or abiotic stresses.
  - change the maturity duration.
  - to get desirable agronomic characteristics.
  - All of these
19. Biological control of agricultural pests, unlike the chemical control, is
- toxic
  - polluting
  - very expensive
  - self-perpetuating
20. Which of the following plants are used as green manure in crop fields and in sandy soils ?
- Dicanthium annulatum* and *Azolla pinnata*
  - Crotalaria juncea* and *Alhagi camelorum*
  - Calotropis procera* and *Pitylanthus niruri*
  - Saccharum munja* and *Lantana camara*
21. Which one is a biofertilizer ?
- VAM
  - Sporeine
  - Devine
  - Agent orange
22. Which one is an improved variety of wheat ?
- A.77
  - Sonalika
  - Chandramukhi
  - Kuber

23. There are \_\_\_\_\_ nutrients that are essential for plants.
  - (a) Six
  - (b) Three
  - (c) Sixteen
  - (d) Seven
24. Macronutrients available from soil are
  - (a) carbon, oxygen, nitrogen, phosphorus, copper and chlorine.
  - (b) carbon, oxygen, hydrogen, calcium, Sulphur and zinc.
  - (c) nitrogen, phosphorus, potassium, calcium, magnesium and sulphur.
  - (d) iron, manganese, boron, zinc, copper, molybdenum and chlorine.
25. Manure helps in improving soil fertility and structure by supplying small quantities of nutrients. It is also advantageous in
  - (a) protecting environment from excessive use of fertilizers
  - (b) recycling farm waste
  - (c) disposing biological waste
  - (d) All of these
26. Select the unsuitable statement
  - (a) Compost and vermi-compost require decomposition of farm waste material in pits.
  - (b) Compost is rich in organic matter and nutrients.
  - (c) Use of earthworms to hasten decomposition of plant and animal refuse produce vermi-compost.
  - (d) Compost is used in very little quantities.
27. The practice of mulching specially grown sun hemp or guar by ploughing them into the soil helps in
  - (a) increasing water holding capacity.
  - (b) enriching the soil in nitrogen and phosphorus.
  - (c) increasing the quantity of earthworms.
  - (d) None of these
28. Fertilizers ensure increased vegetative growth and healthy plants by supplying
  - (a) nitrogen, carbon and oxygen
  - (b) nitrogen, phosphorus and potassium
  - (c) phosphorus, calcium and oxygen

- (d) All of these
29. Find out the correct sentence(s)
- Hybridisation means crossing between genetically dissimilar plants.
  - Cross between two varieties is called as inter specific hybridisation.
  - Introducing genes of desired character into a plant gives genetically modified crop.
  - Cross between plants of two species is called as inter varietal hybridisation.
- (i) and (iii)
  - (ii) and (iv)
  - (ii) and (iii)
  - (iii) and (iv)
30. Find out the correct sentence(s) about manure
- Manure contains large quantities of organic matter and small quantities of nutrients.
  - It increases the water holding capacity of sandy soil.
  - It helps in draining out of excess of water from clayey soil.
  - Its excessive use pollutes environment because it is made of animal excretory waste.
- (i) and (iii)
  - (i) and (ii)
  - (ii) and (iii)
  - (iii) and (iv)
31. Cattle husbandry is done for the following purposes
- Milk production
  - Agriculture work
  - Meat production
  - Egg production
- (i), (ii) and (iii)
  - (ii), (iii) and (iv)
  - (iii) and (iv)
  - (i) and (iv)
32. Which of the following are Indian cattle ?
- Bos indicus*
  - Bos domestica*
  - Bas bubalis*
  - Bos vulgaris*
- (i) and (iii)
  - (i) and (ii)