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CHAPTER 15

OUR ENVIRONMENT

MULTIPLE CHOICE QUESTIONS

Q.1. In a given food chain if the amount of energy at the fourth trophic level is 6 kJ, what will be the energy available at the producer level?

- (a) 6000 kJ (b) 20 kJ (c) 60 kJ (d) 600 kJ

Q.2. Which of the following is a biodegradable waste ?

- (a) DDT (b) Aluminium can
(c) Plastic bag (d) Cow dung

Q.3. Which of the following is the best way for disposal of vegetable and fruit peels?

- (a) Landfill (b) Recycling (c) Composting (d) Burning

Q.4. Accumulation of non-biodegradable pesticides in the food chain in increasing amount at each higher trophic level is known as:

- (a) Eutrophication (b) Pollution (c) Biomagnification (d) Accumulation

Q.5. In an ecosystem, the 10% of energy available for transfer from one trophic level to the next is in the form of :

- (a) heat energy (b) light energy (c) chemical energy (d) mechanical energy

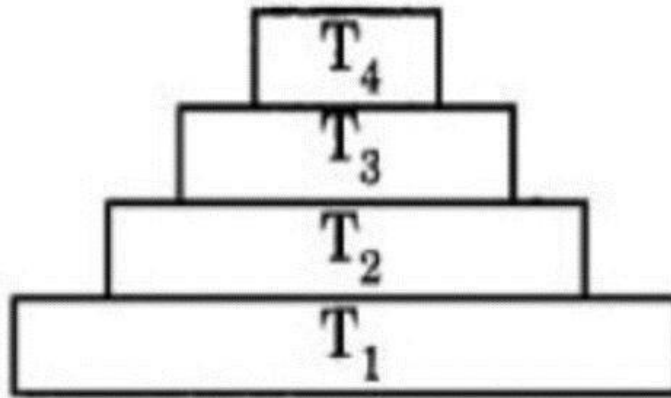
Q.6. In the given Figure, the various trophic levels are shown in a pyramid. At which trophic level is maximum energy available?

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- (a) T₄ (b) T₂ (c) T₁ (d) T₃

Q.7. Which of the statements is incorrect?

- (a) All green plants and blue green algae are producers
- (b) Green plants get their food from organic compounds
- (c) Producers prepare their own food from inorganic compounds
- (d) Plants convert solar energy into chemical energy

Q.8. What will happen if Deer is missing in the food chain given below?

Grass → Deer → Tiger

- (a) The population of tiger increases
- (b) The population of grass decreases
- (c) Tiger will start eating grass
- (d) The population of tiger decreases and the population of grass increases

Q.9. When is the World Environment Day celebrated?

- (a) 16 June (b) 5 December (c) 5 June (d) 5 July

Q.10. Which of these is a greenhouse gas?

- (a) Hydrogen Sulphide (b) Methane (c) Ozone (d) Carbon monoxide

Q.11. The transfer of Energy in a food chain is always:

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- (a) Unidirectional (b) Methane
(c) Bi-directional (d) Random

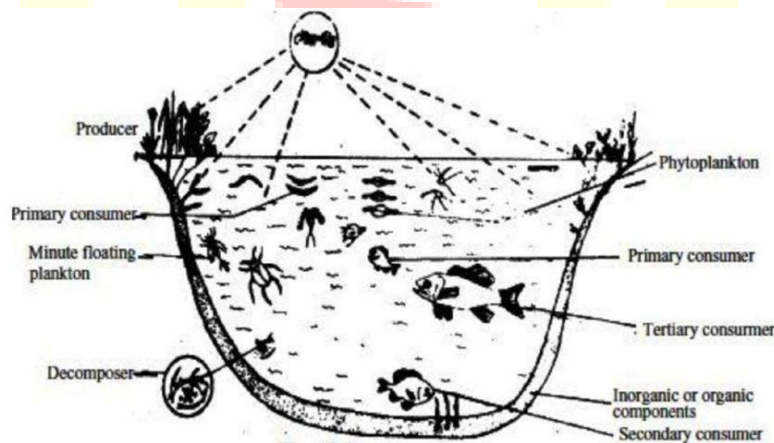
Q.12. If a grasshopper is eaten by frog, then the energy transfer will be from:

- (a) producers to decomposers
(b) producer to primary consumer
(c) primary consumer to secondary consumer
(d) secondary consumer to primary consumer

Q.13. The % of solar radiation absorbed by all green plants for photosynthesis is about ———.

- (a) 1% (b) 5% (c) 8% (d) 10%

Q.14. Study the image given below and answer the following questions.



(i) Which among the following are the Primary Producers?

- (a) Algae (b) Phytoplankton (c) Algae and phytoplankton (d) Green plants

(ii) Which group of organisms may have higher Bio-magnification?

- (a) Producers (b) Primary consumers (c) Secondary Consumer (d) Tertiary consumers

(iii) Which is the Primary source of energy in an ecosystem?

- (a) Soil (b) Water (c) Sun (d) Carbon dioxide

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(iv) The image given above is an example of

- (a) Aquatic ecosystem
- (b) Terrestrial ecosystem
- (c) Land ecosystem
- (d) Natural aquatic ecosystem

Q.15. In 1987 the ----- Succeeded in forging an agreement to freeze CFC Production

- (a) UNESCO
- (b) UNEP
- (c) UNCTED
- (d) UNICEF

Q.16. $O_2 \xrightarrow{UV} O + O$; $O + O_2 \rightarrow O_3$ (Ozone)

The role of UV rays in this reaction is -----

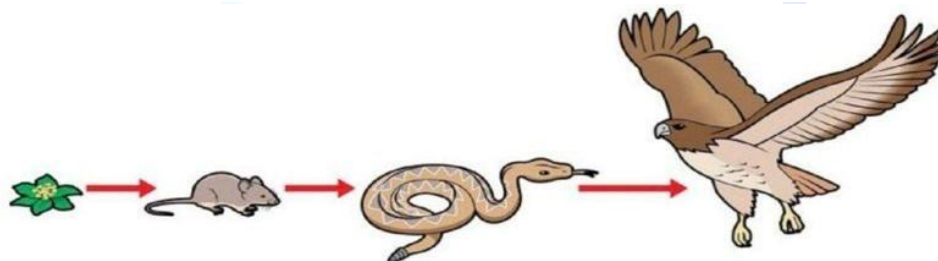
- (a) To Split Oxygen molecule
- (b) To unite oxygen molecule
- (c) To Destroy Ozone
- (d) None

Q. 17. $O_3 \xrightarrow{???} O_2 + (O+O)$

Which substance catalyzes the reaction?

- (a) Chlorine
- (b) Sulphur dioxide
- (c) Hydrogen sulphide
- (d) Neon

Q.18. Find out the energy available to the bird if energy of the plant is 10000 KJ :



- (a) 100 KJ
- (b) 10 KJ
- (c) 1KJ
- (d). 5KJ

Q.19. Which group of waste materials can be classified as Non biodegradable ?

- (a) Plant waste, used tea bags
- (b) Polyethene bags, plastic toys
- (c) Used tea bags, paper straw
- (d) Old clothes, broken footwear

Q.20. Environment includes:

- (a) Land, air, water
- (b) Light, temperature, rainfall



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(c) Plants, animals, microbes

(d) All of these

ASSERTION REASON TYPE QUESTIONS

(a) If both Assertion and reason are true and Reason is the correct explanation of assertion

(b) If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

(c) If Assertion is true but the Reason is false

(d) If both Assertion and Reason are false

Q.1. **Assertion (A)** : Man is a herbivore.

Reason(R) : Omnivores eat both plant food and meat of animals.

Q.2. **Assertion (A)** : Garden is an artificial ecosystem.

Reason(R) : Biotic and abiotic components are manipulated by humans.

Q. 3. **Assertion (A)** : Biotic components of ecosystem continuously require energy to carry on life processes.

Reason(R) : Abiotic components are non-living factors of ecosystem.

Q.4. **Assertion (A)** : Decomposers act as cleaning agents of the environment.

Reason (R) : The decomposers recycle waste material in the hydrosphere.

Q.5. **Assertion (A)** : Food chain is responsible for the entry of harmful chemicals in our bodies.

Reason(R) : The length and complexity of food chain vary greatly.

CASE STUDY QUESTIONS

Q.1. **Read the following and answer the questions :**

The belief the Ganga River is "holy" has not, however, prevented over-use, abuse and pollution of the river. All the towns along its length contribute to the pollution load. It has been assessed that more

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than 80 per cent of the total pollution load (in terms of organic pollution expressed as biochemical oxygen demand (BOD)) arises from domestic sources, i.e., from the settlements along the river course. Due to over-abstraction of water for irrigation in the upper regions of the river, the dry weather flow has been reduced to a trickle. Rampant deforestation in the last few decades, resulting in topsoil erosion in the catchment area, has increased silt deposits which, in turn, raise the river bed and lead to devastating floods in the rainy season and stagnant flow in the dry season. Along the main river course there are 25 towns with a population of more than 100,000 and about another 23 towns with populations above 50,000. In addition, there are 50 smaller towns with populations above 20,000. There are also about 100 identified major industries located directly on

the river, of which 68 are considered as grossly polluting. Fifty-five of these industrial units have complied with the regulations and installed effluent treatment plants (ETPs) and legal proceedings are in progress for the remaining units. The natural assimilative capacity of the river is severely stressed. The principal sources of pollution of the Ganga River can be characterized as follows:

1.1. Accumulation of toxic substances at higher trophic levels of an ecosystem through the food chain in water bodies affects which of the following organisms more?

- (a) Phytoplankton (b) Zooplankton (c) Small fishes (d) Large fishes

1.2. When toxic chemicals and nutrients get deposited in the water bodies, which of the following gases get depleted in the water bodies?

- (a) Oxygen (b) Carbon dioxide (c) Both oxygen and carbon dioxide (d) Nitrogen

1.3. Which of the following activities may pollute the river water more?

- (a) Bathing using detergent and soap (b) Discharging animals excreta
(c) Deposit flowers and leaves as the part of puja (d) Bathing without soap and detergent

1.4. Which of the following organisms grow abundant in water when the water get mixed with nutrients like sulphates, phosphates etc.?

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- (a) Algae (b) Zooplankton (c) Small fishes (d) Large fishes

1.5 .Green Algae and Diatoms are the major producers of Aquatic ecosystem .Which of the following will be more in the aquatic ecosystem:

- (a) Small fishes (b) Large fishes (c) Algae and phytoplankton (d) Tadpole

Q.2. Read the following and answer the questions :

The atmosphere is a blanket of air and a precious natural resource for sustaining life on the Earth. Unfortunately, human activities based on national/personal interests are causing harm to this common resource, notably by depleting the fragile ozone layer, which acts as a protective shield for life on the Earth. Ozone molecules consist of three oxygen atoms, Ozone molecules are exceeding rare: fewer than ten in every million molecules of air. However, for nearly a billion years, their presence in the atmosphere has played a vital role in safeguarding life on Earth. The ozone in the troposphere (up to 110 kilometres above the Earth's surface) is 'bad' ozone which can damage lung tissues and plants. But about 90 per cent of ozone found in the stratosphere (between 10 and 40 kilometres above the Earth's surface) is "good" ozone which plays a beneficial role by absorbing dangerous ultraviolet (UV-B) radiations from the Sun. Without this beneficial ozone layer, humans would be more susceptible to certain diseases due to the increased incidence of ultraviolet rays from the Sun.

2.1. Ozone molecules consists of:

- (a) Three oxygen atoms only (b) two oxygen atoms only
(c) Only one atom of oxygen (d) None of the above

2.2. Depletion of ozone layer is mainly due to

- (a) Use of CFC's (b) Use of halogens (c) Both (a) and (b) (d) None of the above

2.3. U-V rays can cause diseases in humans like

- (a) Skin cancer only (b) Cataract only (c) Lung cancer (d) Both (a) and (b)

2.4. Ozone holes are more pronounced at the :

- (a) Equator (b) Tropic of cancer (c) Tropic of Capricorn (d) Poles

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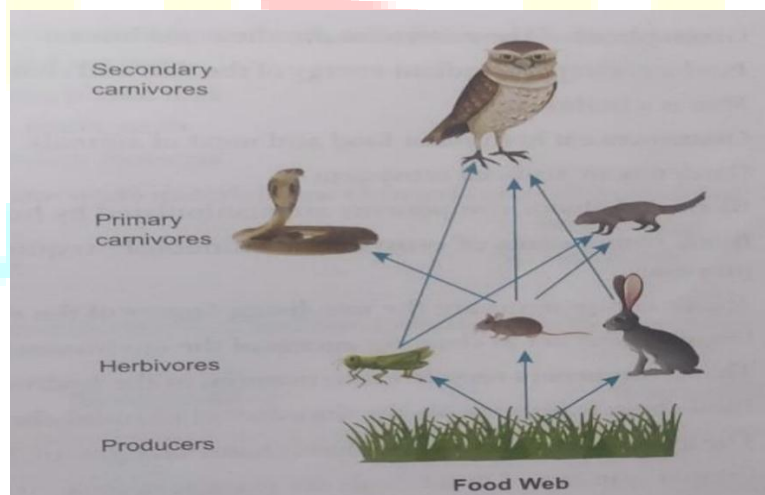
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2.5. Which of the following is an ozone depleting substance?

- (a) Sulphur dioxide (b) Methyl chloride (c) Carbon dioxide (d) Methane

Q.3. Read the following and answer the questions : Food chains are very important for the survival of most species. When only one element is removed from the food chain it can result in extinction of a species in some cases. The foundation of the food chain consists of primary producers. Primary producers, or autotrophs, can use either solar energy or chemical energy to create complex organic compounds, whereas species at higher trophic levels cannot and so must consume producers or other life that itself consumes producers. Because the sun's light is necessary for photosynthesis, most life could not exist if the sun disappeared. Even so, it has recently been discovered that there are some forms of life, chemotrophs, that appear to gain all their metabolic energy from chemosynthesis driven by hydrothermal vents, thus showing that some life may not require solar energy to thrive.



3.1. If 10,000 J solar energy falls on green plants in a terrestrial ecosystem, what percentage of solar energy will be converted into food energy?

- (a) 10,000 J (b) 100 J (c) 1000 J (d) It will depend on the type of the terrestrial plant

3.2. Mr. X is eating curd/yogurt. For this food intake in a food chain he should be considered as occupying

- (a) First trophic level (b) Second trophic level

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(c) Third trophic level

(d) Fourth trophic level

3.3. The decomposers are not included in the food chain. The correct reason for the same is because decomposers:

(a) Act at every trophic level of the food chain

(b) Do not breakdown organic compounds

(c) Convert organic material to inorganic forms

(d) Release enzymes outside their body to convert organic material to inorganic forms

3.4. Which of the following limits the number of trophic levels in a food chain?

(a) Decrease in energy in higher trophic levels

(b) Less availability of food

(c) Polluted air

(d) Water

3.5. Matter and energy are two fundamental inputs of an ecosystem. Movement of

(a) Energy is bidirectional and matter is repeatedly circulating.

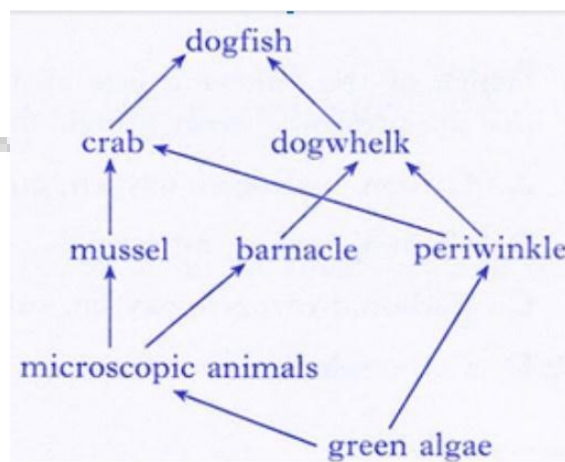
(b) Energy is in repeated circulation and matter is unidirectional.

(c) Energy is unidirectional and matter is repeatedly circulating.

(d) Energy is multidirectional and matter is bidirectional.

Q.4. Read the following and answer the questions :

Observe the food web and answer the Questions given below :



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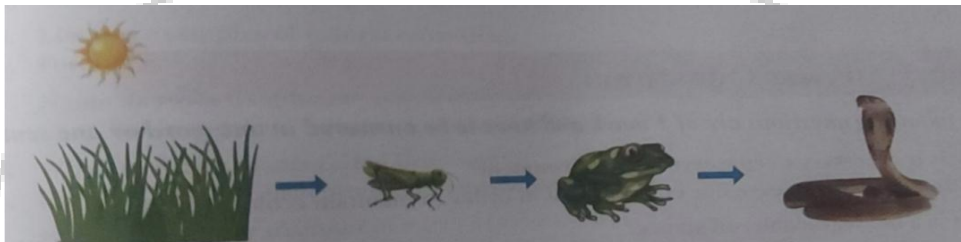
4.1. The mussel can be described as:-

- (a) Producer (b) Primary consumer (c) Secondary consumer (d) Decomposer

4.2. Which trophic level is incorrectly defined?

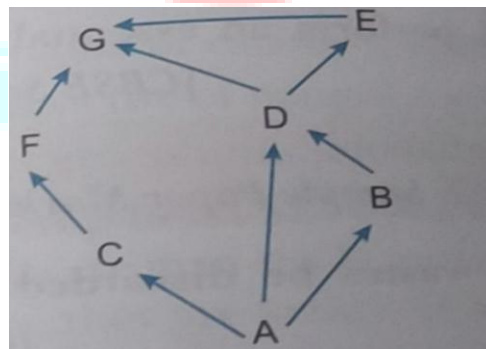
- (a) Carnivores – secondary or tertiary consumers (b) Decomposers – microbial heterotrophs
(c) Herbivores – primary consumers (d) Omnivores – mold, yeast and mushrooms

4.3 The given figure best represents:



- (a) Grass food chain (b) Parasitic food chain (c) Forest food chain (d) Aquatic food chain

4.4. In the food web, what two organisms are competing for food?



- (a) A and B (b) A and C (c) D and F (d) B and D

4.5. Why do all food chains start with plants ?

- (a) Because plants are easily grown. (b) Because plants are nutritious.
(c) Because plants can produce its own energy. (d) Because plants do not require energy.

Q.5. Read the following and answer the questions :

Study the image given below and answer the following questions.

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ANS	A	D	C	C	C	B	C	D	C	B
Q. NO.	11	12	13	14	15	16	17	18	19	20
ANS	A	C	A	C	B	A	A	B	B	D

ASSERTION REASON TYPE QUESTIONS

Q. NO.	2.1	2.2	2.3	2.4	2.5
ANS	D	A	B	C	B

CASE STUDY QUESTIONS

Q. NO.	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	2.4	2.5
ANS	D	C	A	A	A	A	C	D	D	B
Q. NO.	3.1	3.2	3.3	3.4	3.5	4.1	4.2	4.3	4.4	4.5
ANS	B	C	A	A	C	C	D	A	D	C
Q. NO.	5.1	5.2	5.3	5.4	5.5					
ANS	C	C	D	C	D					

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VERY SHORT ANSWER TYPE QUESTIONS

Q.1. What is the full form of CFCs and UNEP?

Ans: CFC=Chlorofluorocarbons UNEP = United Nations Environment

ProgrammeQ.2. Construct an aquatic food chain showing four trophic levels.

Ans: Phytoplankton → Zooplankton → Small fish → Bird.

Q.3. List two causes of depletion of ozone layer

Ans: Two causes of depletion of ozone layer are as follows:

- a. Use of CFC's
- b. Use of Halogens

Q.4 Why are crop fields known as artificial ecosystems?

Ans: Crop fields are man made and some biotic and abiotic components are manipulated by humans

Q.5. What are decomposers? Give two examples.

Ans: Decomposers are organisms that live on dead and decaying matter. They convert complex organic material into simple materials and mix with soil. Eg: fungi, bacteria.

SHORT ANSWER TYPE QUESTIONS

Q.1. Differentiate between biodegradable and non-biodegradable substances with the help of one example each. List two changes in habit that people must adapt to dispose non-biodegradable waste for saving the environment.

Ans: A. Biodegradable substances: Substances that can be slowly destroyed and broken down into very small parts by natural processes i.e., by bacteria, fungi, etc. For example, organic wastes like vegetables and fruit peels.

B. Non-biodegradable substances: Substances that cannot be broken down or decomposed into the soil by natural agents are called as nonbiodegradable. For example, plastic. a. Segregating

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and treating the non-biodegradable waste before putting in dustbins. b. Recycle the plastics or glass

present in non-biodegradable wastes. c. Motivate people to use paper or jute bags instead of plastic bags.

Q.2 How is ozone formed in the higher level of the atmosphere? "Damage to ozone layer is a cause of concern". Justify this statement.

Ans: Ozone is formed due to action of UV rays on oxygen molecules to form free oxygen atom which subsequently combines with another molecule of oxygen to form ozone. The reaction is: $O + O_2 \rightarrow O_3$ (Ozone) Ozone depletion is a cause of concern because it protects us from the harmful ultraviolet radiations of the Sun by absorbing them. The UV rays can cause skin cancer, ageing, cataract, etc. to human beings if they are not absorbed by ozone due to ozone depletion.

Q.3. Explain phenomenon of "biological magnification". How does it affect organisms belonging to different trophic levels particularly the tertiary consumers?

Ans: The levels of harmful toxicants/pesticides like DDT get increased at successive trophic levels as they are neither metabolized nor excreted by the organism. They get accumulated in organism's body with their higher concentrations at higher trophic levels. This is called as biological magnification. Since, the tertiary consumers are at the top of the food chain, so a higher amount of these toxicants is present in them compared to the lower trophic levels.

Q.4. Pesticides like DDT which are sprayed to kill pests on crops are found to be present in the soil, ground water, water bodies etc. Explain. How do they reach these places?

Ans: Soil: Pesticides are used to protect plants from insects. They consequently get settled into soil particles, when used on plants. Groundwater: Through irrigation in the fields, these pesticides present in soil pass into lower layers of soil and reach ground water.

Q.5. Food web increases the stability of an ecosystem. Justify.

Ans: Food web shows food relationship in an ecological community. It consists of many food chains.

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Thus, if any one organism becomes endangered or extinct, the one dependent in it has an alternative option available to him for survival. In this way food web increases stability in the ecosystem

LONG ANSWER TYPE QUESTIONS

Q.1. Explain some harmful effects of agricultural practices on the environment.

Ans: Harmful effects of agricultural practices on the environment are

- Change in the chemistry of soil and killing of useful microbes due to excessive use of fertilizers.
- Biological magnification occurs due to excessive use of chemical pesticides.
- Water table gets lowered due to the excess use of ground water.
- Soil fertility is lost due to extensive cropping.
- The natural ecosystems are harmed due to ploughing during agriculture.

Q.2. In a food chain, if 10000 Joules of energy is available to the producer, how much energy will be available to the secondary consumer to transfer it to the tertiary consumer?

Ans: . Energy which will be available to the secondary consumer to transfer it to the tertiary consumer are

- Energy available to producers = 10,000 Joules. Energy transfer to producer = 1% of 10,000 Joules = 100 Joules.
- According to Ten per cent law, Energy transfer to primary consumer = $10100 \times 100 = 10$ Joules.
- Energy transfer to secondary consumer = $10100 \times 10 = 1$ Joule. d. Energy transfer to tertiary consumer = $10100 \times 1 = 0.1$ Joule

Q.3. Suggest any four activities in daily life which are eco-friendly.

Ans: The eco-friendly activities in life are

- Planting of trees

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- b. Segregating biodegradable and non-biodegradable wastes
- c. Using cloth bags, jute bags or paper bags instead of plastic bags
- d. Creating awareness on environment protection through initiatives and campaigns
- e. Using of manures and organic agricultural methods Using less of chemical fertilizers and pesticides
- f. Controlling pollution by using fuels like CNG.

Q.4. "Energy flow in a food chain is unidirectional". Justify this statement. Explain how the pesticides enter a food chain and subsequently get into our body.

Ans: Because the energy moves progressively through the various trophic levels and is no longer available to the previous trophic level. The energy captured by autotrophs does not revert to the solar input.

- a. Pesticides, used for crop protection when washed down into the soil/ water body, are absorbed by the plant along with water and minerals
- b. Plants are consumed by animals and these chemicals get into animal body
- c. Being non-biodegradable, these chemicals get accumulated progressively in the food chain and into our body
- d. As we go into higher levels of food chain amount of harmful substances will increase in the body of organisms as a result of biomagnification

Q.5. (a) In the following food chain, 5 J of energy is available to man. How much energy was available at the producer level?

Plants → Sheep → Man

(b) Explain phenomenon of "biological magnification". How does it affect organisms belonging to different trophic levels particularly the tertiary consumers?

Ans: (a) By 10% energy law the required energy available at the producer level was 500 Joules.

(b) The levels of harmful toxicants/pesticides like DDT get increased at successive trophic levels as they are neither metabolized nor excreted by the organism. They get accumulated in organism's body with their higher concentrations at higher trophic levels. This is called as biological magnification. Since, the tertiary consumers are at the top of the food

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