Exercise-6(B)

1. **What is an ecosystem? Name its two components.**
   Solution:
   It is a unit composed of biotic components (consumers, producers) and abiotic components (heat, rain, humidity).
   The two components of ecosystem are:
   - Biotic component
   - Abiotic component

2. **What is the source of energy for all ecosystems?**
   Solution:
   The most significant source of energy for all ecosystems is the Sun.

3. **State the importance of green plants in an ecosystem**.
   Solution:
   Plants absorb most of the energy that is incident on them, and out of all the energy absorbed, only 0.02% is utilized in photosynthesis to produce food, hence they are called as producers. Green plants are involved in producing food for the consumers, serving as the primary producers of the ecosystem. Not only for synthesis of food, green plants are crucial in maintaining the balance of carbon dioxide and oxygen on the planet.

4. **Differentiate between the producers and consumers.**
   Solution:
   The differences are as follows:

Producers	Consumers
They produce their own food using energy from the Sun	They do not produce their own food, depend on producers for their nutritional requirements
Example: Green plants	Example: Herbivores

5. **State the functions of decomposers in an ecosystem.**
   Solution:
   The functions of decomposers in an ecosystem are:
   - Disintegrates dead organisms and obtain their nutritional requirements from them.
   - Dead organisms create nutrients which revert to the soil, to be reused by plants-the producers.
   - Once returned to the soil, they are used up as a source of food by fungi and bacteria by converting from complex organic matter to simpler nutrients.
   - These nutrients in the simplest form can then be used by the producers to resume the cycle.
   - Hence decomposers play a critical role in the ecosystem.

6. What is a food chain?

Solution:

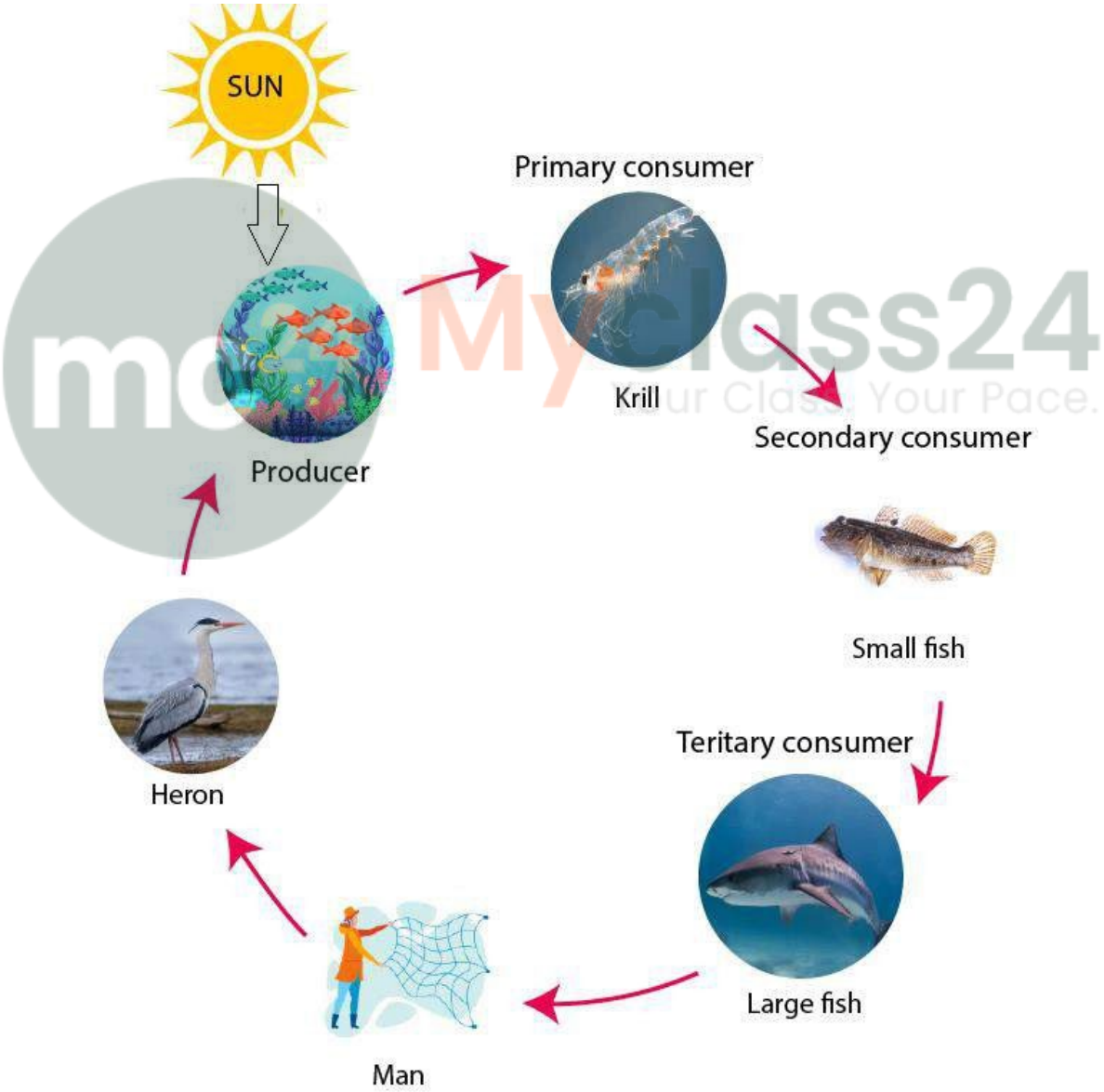
A food chain demonstrates the feeding or nourishing relationship that is shared between varied living entities in a specific habitat or environment. The food chain begins with producers, that synthesize their own food with using energy from the Sun. Next in the chain, are the primary consumers (herbivores) that depend on producers for their nutritional requirements.

Food chain is a series of events, depicting the energy flow from the Sun to the producers, from the consumers to the decomposers.

7. Draw a simple diagram showing a food chain.

Solution:

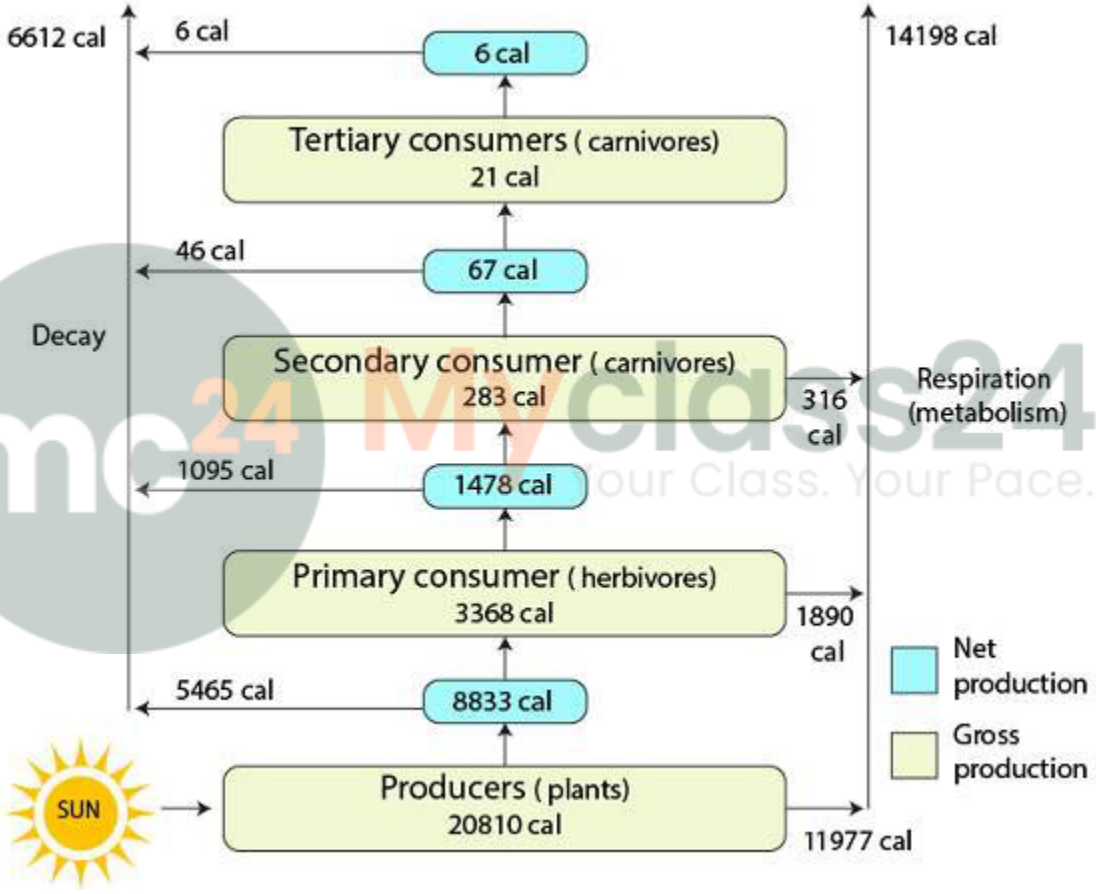
The diagram below depicts a simple food chain.



8. Describe the energy flow in an ecosystem.

Solution:

The rotation of energy and the nutrients that are obtained from external sources brings about a maintenance in the ecosystem. Plants, a few bacteria, algae are some of the primary producers at the trophic level utilizing energy from the Sun to synthesize organic plant material with the help of a process called as photosynthesis. The second trophic level is formed by the herbivores or the primary consumers that entirely depend upon producers for their nutritional requirements. The third trophic level comprises of predators that consumer the herbivores. In case larger predators are found, they would comprise higher trophic levels. Fungi, bacteria etc. are the decomposers that disintegrate wastes and dead organic matters which eventually revert to the soil.



9. State the law which governs the energy flow in an ecosystem.

Solution:

The energy flow in an ecosystem is governed by the laws of Thermodynamics.

First Law of Thermodynamics – The energy can be transmitted from one form to another, but it can neither be created nor be destroyed.

Second Law of Thermodynamics – When energy is used, always, a part of it is converted to an unused heat form because of radiation and friction.

10. Show that the energy flow in an ecosystem is linear.

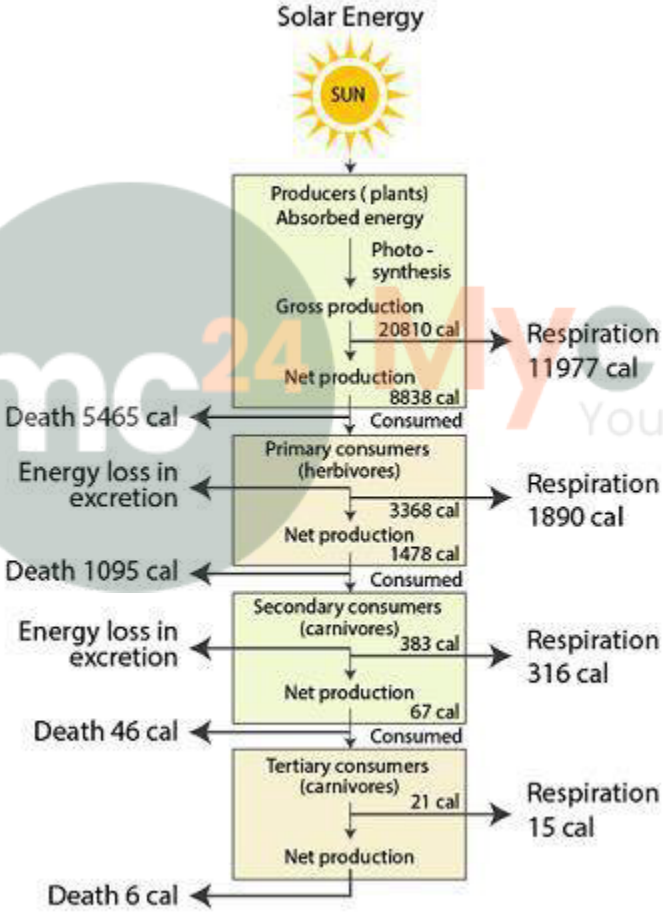
Solution:

Plants are the primary producers, they absorb solar energy to synthesize food. This food is then used up by the primary consumers, they in turn are consumed by the secondary consumers, and the secondary by the tertiary consumers. This flow of energy from the producers till the tertiary consumers is unidirectional or linear. The dead and decaying matter resulting from the food chain are consumed by the decomposers which in turn revert the nutrients to the soil, ready to be consumed by the plants, causing the energy to reach the degraded state. The process cannot be returned to the Sun to be cyclic, hence the energy flow in the ecosystem is linear.

11. Draw a simple diagram showing the energy flow in a food chain.

Solution:

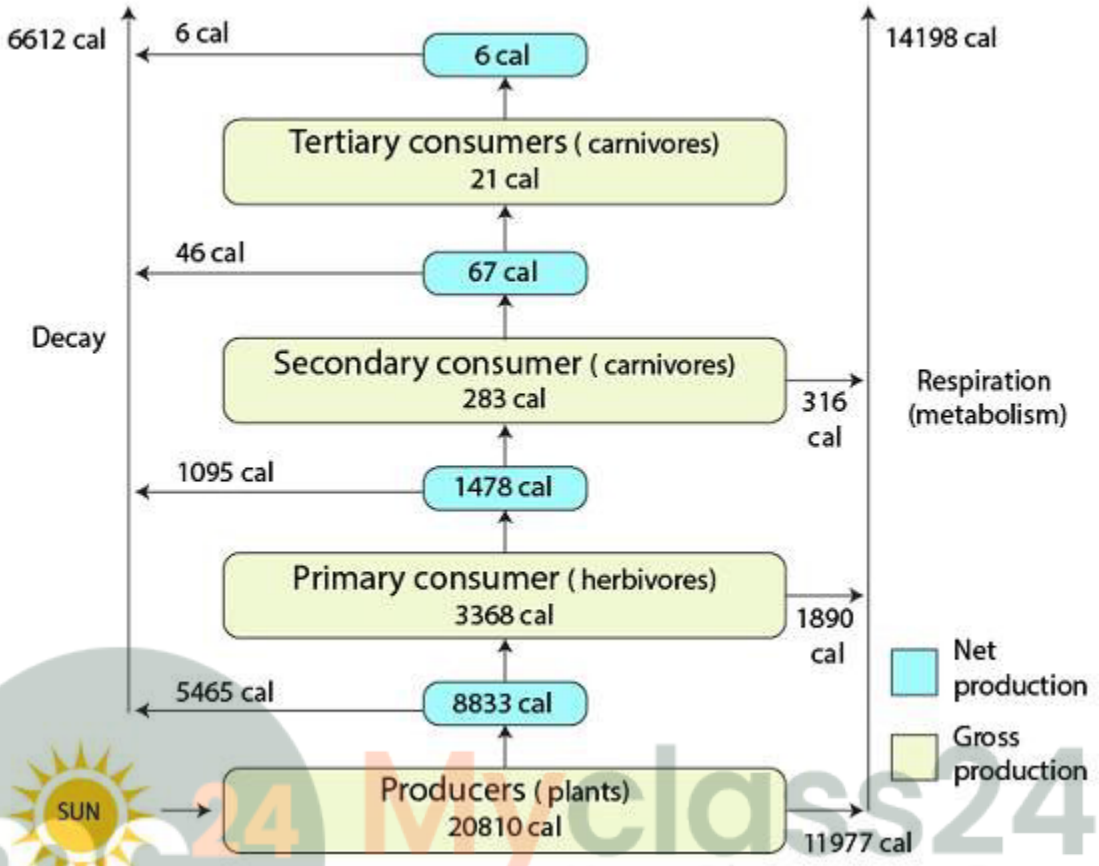
The following diagram shows the energy flow in a food chain:



12. Draw a diagram to show that the energy flow in an ecosystem is governed by the law of conservation of energy.

Solution:

The diagram shows the energy flow in an ecosystem is governed by the law of conservation of energy.



Multiple choice type:

1. **Food chain begins with:**
   (a) Respiration
   (b) Photosynthesis
   (c) Decomposition
   (d) Decay
   Solution:
   (b) Photosynthesis
   The first trophic level is formed by the primary producers, the green plants which produce food through the process of photosynthesis.

2. **The source of energy in an ecosystem is:**
   (a) Sun
   (b) Decayed bodies
   (c) Green plants
   (d) Sugar
   Solution:
   (a) Sun
   The Sun is the ultimate source of energy for all ecosystems.

3. **Energy enters in a food chain through:**
   (a) Primary consumers
   (b) Secondary consumers
   (c) Tertiary consumers
   (d) Producers
   Solution:
   (d) Producers
   Green plants, some bacteria form the first trophic level in the food chain. They are the primary producers.

4. **The place of human beings in food chain in an ecosystem is as a:**
   (a) Producer
   (b) Consumer
   (c) Decomposer
   (d) Both (a) & (b)
   Solution:
   (b) Consumer
   Human beings depend upon the primary producers, the plants, for their nutritional requirements.

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