



**Blue Print (As per PU Board)**

Topic	1 mark questions	2 marks questions	3 marks questions	5 marks questions	Total Marks
Ecosystems	3	2	-	3	22

**One mark questions**

- Define net primary productivity?**  
Answer: Gross primary productivity minus respiration loss (R), is net primary productivity
- What is detritus?**  
Answer: Dead plant remains such as leaves, bark, flowers and dead remains of animals, including fecal matter, constitute detritus
- What is 10% law?**  
Answer: The number of trophic levels in the grazing food chain is restricted as the transfer of energy follows 10% law i.e., only 10% of the energy is transferred to each trophic level from the other.

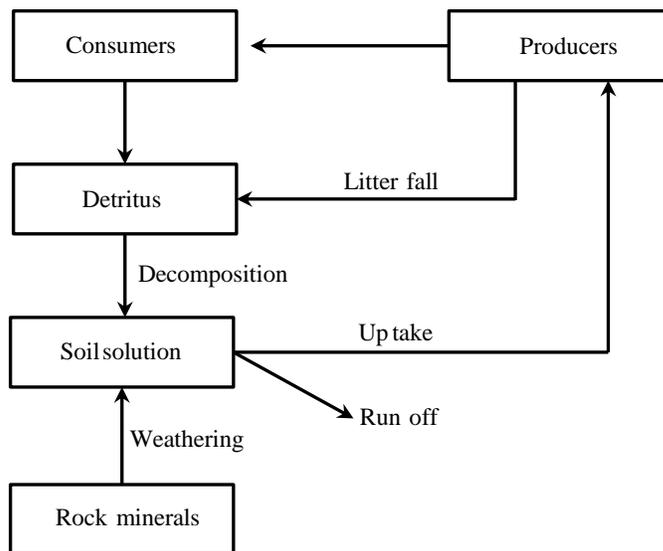
**Two marks questions**

- Give an example of an ecological pyramid which is always upright. Justify your answer**  
Answer: Pyramid of energy is always upright and can never be inverted, because when energy flows from a trophic level to the next trophic level some energy is always lost as heat at each step
- Differentiate between a detritivore and a decomposer giving an example of each**  
Answer: Detritivore feeds on dead plants and animals/ detritus  
Example: Earthworm/nematodes  
Decomposer breaks down complex (organic) matter into simpler (inorganic) matter  
Example: Fungus/Bacteria.
- Write a note on detritus food chain.**  
Answer: DFC Begins with dead organic matter and pass through detritus feeding organism in soil to organisms feeding on detritus – feeders. In aquatic ecosystem GFC is the major conduit for energy flow. In terrestrial ecosystems a much larger fraction of energy flows through the DFC than through GFC.

**Three marks questions**

- Schematically represent simplified modes of phosphorus cycle**

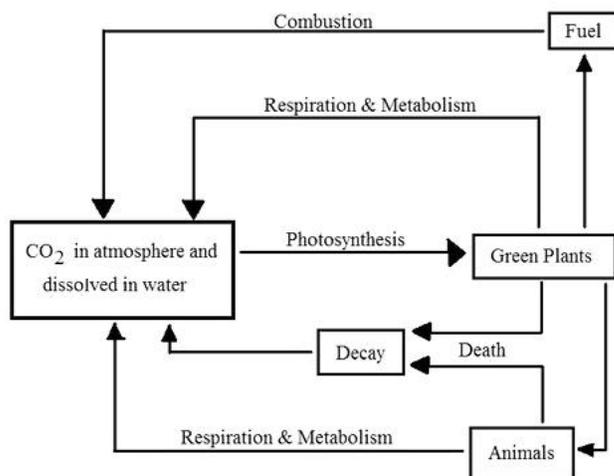
Answer:





8. Schematically represent simplified modes of carbon cycle

Answer:



Basic Carbon Cycle Flow Diagram

9. Both carbon and phosphorous cycles are biogeochemical cycles but they differ in three aspects. List them

Answer: (1) Carbon cycle.

- (i) Reservoir exits in atmosphere
- (ii) Considerable inputs of carbon through rainfall
- (iii) Evident gaseous exchange between organisms and environment takes place.

2. Phosphorous cycle

- (i) Reservoir exits in earth's crust
- (ii) Negligible inputs of phosphorous through rainfall
- (iii) Gaseous exchange between organisms and environment is extremely negligible

**Five marks questions**

- 10. (a) Define productivity and mention its unit. (2 mark)
- (b) Describe the types of primary productivity (2 mark)
- (c) Distinguish between GPP and NPP (1 mark)

Answer: (a) The rate of production of biomass or organic matter by producers during photosynthesis is called productivity. It is expressed in terms of weight ( $g^{-2} yr^{-1}$ ) or energy ( $K cal m^{-2}$ )  $yr^{-1}$

(b) Primary productivity is of two types

- (i) Gross primary productivity: Total production of organic matter during photosynthesis is called GPP
- (ii) Net primary productivity:  $GPP - R = NPP$ .

GPP		NPP	
1.	It is the total biomass production of producers	1.	It is biomass left in producers after utilization of organic matter during their respiration
2.	It is always more than NPP	2.	It is always less than GPP

11. What is nutrient cycling? Explain the types of biogeochemical cycles mentioning examples for each

Answer: The cyclic movement of nutrient elements through the various components of an ecosystem is called nutrient cycling or biogeochemical cycle.



There are two types of biogeochemical cycles, namely:

(1) The gaseous cycle.

The exchange of gaseous nutrients between the biotic and abiotic components of an ecosystem is called gaseous cycle

Example: Carbon cycle

(2) The sedimentary cycle.

The exchange of inorganic nutrients like phosphorous and sulphur between the living and non-living components is called sedimentary cycle.

Example: Phosphorous cycle.

**12. Briefly describe the different stages involved in decomposition**

Answer: (1) Fragmentation: It is break down of detritus into smaller particles by detritivores like earthworm

(2) Leaching: It is the process in which water soluble inorganic nutrient go down into the soil and get precipitated as unavailable salts

(3) Catabolism: It is the process in which bacterial and fungal enzymes degrade detritus into simpler inorganic substances.

(4) Humification: It is the process which leads to the accumulation of a dark coloured amorphous substance called humus

(5) Mineralization: It is the degradation of humus by some microbes and the release of inorganic nutrients into the soil