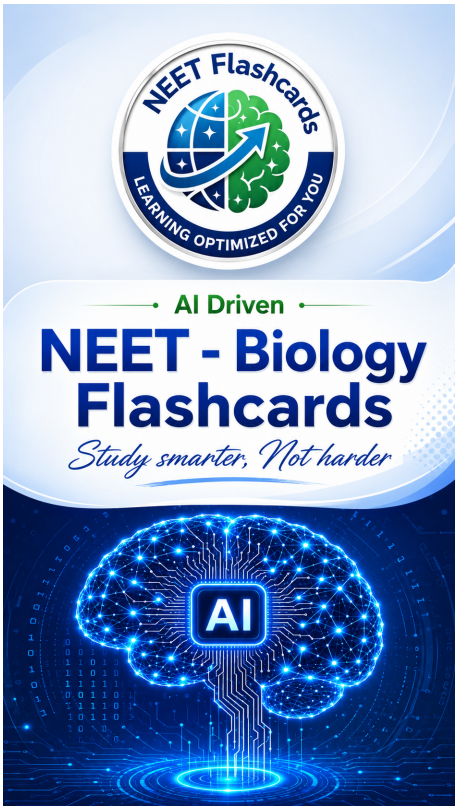
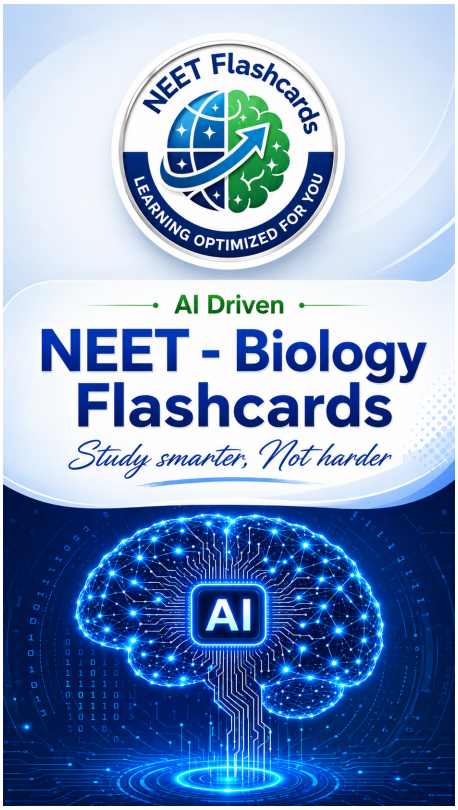


Question	Answer
Along which gradient do protons move during ATP synthesis?	Along the electrochemical proton gradient.
Are pure proteins or fats generally used alone as respiratory substrates in living organisms?	No, respiratory substrates are often more than one.
Can fats and proteins be used to yield energy during respiration?	Yes, they can also be broken down to yield energy.
Define respiration.	Respiration is the breaking of C - C bonds of complex compounds through oxidation within cells, releasing energy.
Differentiate between glycolysis and citric acid cycle.	Glycolysis occurs in cytoplasm and forms pyruvate, whereas citric acid cycle occurs in mitochondria and oxidises acetyl CoA.
Give an example of a grazing food chain (GFC).	Grass → Goat → Man
Give examples of terrestrial ecosystems.	Forest, grassland, and desert are examples of terrestrial ecosystems.
How are fatty acid synthesis and respiration interconnected?	Acetyl CoA can enter respiration during breakdown or be withdrawn for fatty acid synthesis.
How does energy move in an ecosystem?	Energy moves unidirectionally towards higher trophic levels and is lost as heat to the environment.
How is oxidation of NADH different in fermentation and aerobic respiration?	NADH is oxidised slowly in fermentation but vigorously in aerobic respiration.
How many ATP molecules are produced from oxidation of one NADH molecule?	Three ATP molecules.
In a forest ecosystem, which plants occupy the top, second, and bottom layers?	Trees occupy the top layer, shrubs the second, and herbs and grasses the bottom layers.
In most ecosystems, what is the nature of pyramids of number, biomass, and energy?	They are upright.
In which organisms does fermentation commonly occur?	Many prokaryotes, unicellular eukaryotes, and germinating seeds.
Into what are fatty acids degraded before entering respiration?	Acetyl CoA.
Into what does glucose-6-phosphate isomerise?	Fructose-6-phosphate.
Into what is oxygen reduced during oxidative phosphorylation?	Water.
Into which two types is primary productivity divided?	Gross Primary Productivity (GPP) and Net Primary Productivity (NPP).
What are obligate anaerobes?	Organisms that require anaerobic conditions.
What are primary consumers usually called?	Primary consumers are herbivores.

Question	Answer
What are the autotrophic components in a pond ecosystem?	Phytoplankton, algae, and floating, submerged, and marginal plants.
What are the end products of complete combustion of glucose?	Carbon dioxide, water, and energy.
What are the end products of complete combustion of glucose?	Carbon dioxide, water, and energy.
What are the three major pathways in which cells handle pyruvic acid?	Lactic acid fermentation, alcoholic fermentation, and aerobic respiration.
What are the three processes involved in decomposition?	Fragmentation, leaching, and catabolism.
What are the two types of nutrient cycles?	Gaseous cycles and sedimentary cycles.
What assumption is made regarding respiratory substrates?	Only glucose is respired and no alternative substrates enter the pathway.
What does each bar in an energy pyramid represent?	It represents the amount of energy present at each trophic level per unit area in a given time or annually.
What does the apex of an ecological pyramid represent?	The apex represents tertiary or top-level consumers.
What gives an ecosystem its characteristic physical structure?	Interaction among abiotic and biotic components gives an ecosystem its characteristic physical structure.
What happens during leaching?	Water-soluble inorganic nutrients move down into the soil horizon and get precipitated as unavailable salts.
What happens in animal muscles during vigorous exercise?	Pyruvic acid is reduced to lactic acid when oxygen is inadequate.
What happens to PGAL during formation of BPGA?	PGAL is oxidised and combines with inorganic phosphate.
What happens to the energy trapped by producers?	The energy trapped by producers is either passed on to consumers or lost when the organism dies.
What is glycolysis?	Glycolysis is the breakdown of glucose to pyruvic acid without the help of oxygen.
What is standing crop?	The mass of living material present at a trophic level at a particular time is called standing crop.
What is the 10 percent law?	Only 10% of energy is transferred from one trophic level to the next higher trophic level.
What is the approximate annual net primary productivity of the biosphere?	Approximately 170 billion tons (dry weight) of organic matter.

Question	Answer
What is the primary source of energy for almost all ecosystems on Earth?	The sun is the primary source of energy for all ecosystems except deep sea hydro-thermal ecosystems.
What is the RQ value when carbohydrates are completely oxidised?	RQ = 1.
What is the significance of step-wise release of energy in respiration?	It helps trap energy efficiently in ATP instead of losing it as heat.
What must be included in calculations of energy content, biomass, or numbers at a trophic level?	All organisms at that trophic level must be included.
What type of nutrition do animals show?	Animals are heterotrophic and obtain food directly or indirectly from plants.
What type of phosphorylation occurs during synthesis of GTP in the TCA cycle?	Substrate-level phosphorylation.
Where does aerobic respiration occur in eukaryotes?	Within the mitochondria.
Where does glycolysis occur?	Glycolysis occurs in the cytoplasm of the cell.
Where is cytochrome c located?	On the outer surface of the inner mitochondrial membrane.
Where is the electron transfer process located in mitochondria?	On the inner mitochondrial membrane.
Where is the Electron Transport System located?	In the inner mitochondrial membrane.
Which ecological pyramids are specifically mentioned for description?	Pyramids of number and biomass.
Which enzyme catalyses formation of citric acid in the TCA cycle?	Citrate synthase.
Which food chain is the major conduit for energy flow in aquatic ecosystems?	Grazing Food Chain (GFC) is the major conduit in aquatic ecosystems.
Which is the most common respiratory substrate?	Glucose.
Which trophic level do herbivores occupy?	Herbivores or primary consumers occupy the second trophic level.
Which trophic level has the largest population in a food chain?	Producers have the largest population in a food chain.
Which two ecosystem processes are asked to be distinguished in the exercises?	Production and decomposition.
Which type of detritus decomposes slowly?	Detritus rich in lignin and chitin decomposes slowly.
Why do ecological pyramids fail to represent natural ecosystems completely?	They assume a simple food chain and do not accommodate food webs.

Question	Answer
Why do ecosystems require a constant supply of energy?	Ecosystems require constant energy to synthesise molecules and counteract increasing disorderliness.
Why is all GPP not available to consumers?	A considerable amount of GPP is utilised by plants in respiration.
Why is ATP called the energy currency of the cell?	ATP stores energy released during respiration and supplies it when needed.
Why is breathing essential to life?	Breathing is connected to the release of energy from food required for life activities such as absorption, transport, movement, reproduction, and breathing itself.
Why is oxygen not a problem in photosynthesising cells?	Oxygen is released within the cell during photosynthesis.
Why is the diffusion distance for gases small even in large plants?	Each living cell in a plant is located quite close to the surface of the plant.
Why is the respiratory pathway called amphibolic?	Because it involves both anabolism and catabolism.



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