

Subject Name - Biology for Engineers

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Assignment 3

① Physiological - It helps in the survival of an organism.
Eg - A rabbit's body temperature is 38°C. It helps in the survival of the rabbit.

② Behavioural - It helps in the survival of an organism.
Eg - A rabbit's body temperature is 38°C. It helps in the survival of the rabbit.

③ Structural - It helps in the survival of an organism.
Eg - A rabbit's body temperature is 38°C. It helps in the survival of the rabbit.

④ Reproductive - It helps in the survival of an organism.
Eg - A rabbit's body temperature is 38°C. It helps in the survival of the rabbit.

⑤ Defensive - It helps in the survival of an organism.
Eg - A rabbit's body temperature is 38°C. It helps in the survival of the rabbit.

Q1) what are the different kind of adaptations explain with examples?

Ans → The different kind of adaptations are-

① Behavioural - Responses made by an organism that help it to survive/reproduce.

Eg - A adult male penguins huddle together during winter. This helps them to avoid heat loss and survive until spring

② Physiological - A body process that helps an organism to survive/reproduce

Eg - A penguin's resting heart rate can slow down greatly during a dive so that it can conserve oxygen underwater and spend more time finding food.

③ Structural - A feature of an organism's body that helps it to survive/reproduce.

Eg - Penguins have a short stiff tail. They can lean backwards and balance on their heels and their tail. This reduces heat loss from their feet to the ground.

Q2) Explain the steps involved in cellular respiration process?

Ans → The steps involved in Cellular respiration are -

① Glycolysis -

In glycolysis, glucose - a six carbon sugar - undergoes a series of chemical transformations.

② Pyruvate oxidation -

Each pyruvate from glycolysis goes into the mitochondrial matrix - the innermost compartment of mitochondria.

③ Citric acid cycle -

The acetyl CoA made in the last step combines with a four-carbon molecule and goes through a cycle of reactions, ultimately regenerating the four-carbon starting molecule.

④ Oxidative phosphorylation -

At the end of the electron transport chain, oxygen accepts electrons and takes up protons to form water.

Q3) Define endotherm and ectotherm.

Ans → ① Endotherm -

An endotherm is an organism that maintains its body at a metabolically favorable temperature, largely by the use of heat released by its internal bodily functions instead of relying almost purely on ambient heat.

② Ectotherm -

An ectotherm is an organism in which internal physiological sources of heat are of relatively small or of quite negligible importance in controlling body temperature.

Q4) Define photosynthesis -

Ans → Photosynthesis -

Photosynthesis is a process used by plants and other organisms to convert light energy into chemical energy that, through cellular respiration, can later be released to fuel the organism's activities.

Q5) what are the different kinds of symmetry present in biological organisms? Mention examples of each symmetry.

Ans) The different kinds of symmetry present in biological organism are -

① Radial symmetry -

organisms with radial symmetry show a repeating pattern around a central axis such that they can be separated into several identical pieces when cut through the central point, much like pieces of a pie.
Eg - sea anemone, jelly fish, star fish etc.

② Icosahedral symmetry -

Icosahedral symmetry occurs in an organism which contains 60 subunits generated by 20 faces, each an equilateral triangle, and 12 corners.

Eg - Circovirus, Octahedrus, Lithocubus geometricus

③ Spherical symmetry -

Spherical symmetry is characterised by the ability to draw an endless, or great but finite, number of symmetry-axes through the body.

Eg - Radiolaria & Heliozoa. etc.

④ Bilateral Symmetry -

Organisms with bilateral symmetry contain a single plane of symmetry, the sagittal plane, which divides the organism into two roughly mirror image left and right halves.

Eg - *saturnia pavonia*, orchid etc

⑤ Biradial Symmetry -

Biradial symmetry is found in organisms which show morphological features of both bilateral and radial symmetry.

Eg - ctenophores, Hydra etc.