TickMark.Ai
Mumbai

Class: EM - CLASS 10 **Subject:** Science and Technology - Part 2 **Time:**1 hrs
Date: 03-10-2025 **Paper:** Semester 1 (Solution) **Marks:**40

Q1(A))
(1) Green Peace
(2) pyruvate
(3) meiotic
(4) light
(5) Appendix

(B))
(1) anaerobic
(2) 1) - d - iii, 2) - c - iv
(3) Paddy field – Grasshopper – Frog – Snake – Eagle
(4) Girl
(5) True

Q2(A))
(1) i. To generate energy, several power plants are built in which different sources are utilized to create energy transformations and get desired energy.
ii. Natural resources such as Natural Gas, coal, crude oils, petroleum gas are fossil fuels used to generate electricity. Use of these resources cause environmental degradation.
iii. Air pollution is major result. If energy is not conserved, use these resources increase and leads to exploitation and depletion of these resources.
iv. Majority sources used today are conventional and non-renewable. Also they have hazardous impact on environment causing global warming and acid-rains. Therefore, saving energy is the need of the hour.
(2) i. The ultimate source of energy in an ecosystem is the Sun.
ii. The part of the energy received by an ecosystem from the Sun is stored in food molecules by plants.
iii. When this energy is transferred from one trophic level to another trophic level, some part of energy is released in the form of heat and some part is utilized for metabolism.
iv. No energy in the ecosystem goes back to the Sun.
v. Thus, the flow of energy in the ecosystem is unidirectional.
(3) i. Fiber is important for digestion and should be included in the diet.
ii. Fibers cannot be digested but they help in digestion of other substances and egestion of undigested waste.
iii. Roughage in form of dietary fiber is useful for proper digestion and helps in bowel movement.
iv. Fibers can be obtained from leafy vegetables, fruits, cereals. Etc,
v. Hence, fibers are one of the important nutrients.

(B))
(1) (1) Physical, chemical and biological factors affecting the living organisms in any possible way is collectively called as environment.
(2) Biotic, abiotic, natural and artificial factors are included in environment.
(2) i. Solar power is pollution free and does not emit any harmful gases during the process.
ii. It does use natural fuels as coal, CNG and thus dependence on fossil on fuels is reduced.
iii. It produces renewable clean power every day, with long life span.
(3) The science of heredity is useful in the following ways :

i. For diagnosis of hereditary disorders.
ii. For treatment of hereditary disorders
iii. For prevention of hereditary disorders
iv. For production of hybrid varieties of animals and plants
v. For using microbes in the industrial processes.

(4) i. In the process of sexual reproduction, there is union of gametes producing new offspring. Gametes are formed due to cell division.
ii. In asexual reproduction also cell division occurs.
iii. Hence due to cell division, formation of new organism of same species by earlier existing organism take place.

(5) Mitosis:
i. In mitosis one diploid (2n) parent cell form two diploid (2n) daughter cells.
ii. Daughter cells are genetically similar to parent cells.
iii. Mitosis is essential for growth of the body.

Meiosis:
i. In meiosis one diploid (2n) parent cell form four haploid (n) daughter cells.
ii. Daughter cells are genetically different from parent cells.
iii. Meiosis plays an important role in sexual reproduction.

Q3)

(1) i. In Hydra, under favourable conditions, at specific part of its body, an outgrowth is formed by repeated divisions of regenerative cells of body wall. This outgrowth is called as bud.
ii. Bud grows up progressively and finally forms a small hydra.
iii. Dermal layers and digestive cavity of the budding hydra are in continuity with those of parent hydra.
iv. Parent hydra supplies nutrition to the budding hydra.
v. Budding hydra separates from parent hydra and starts to lead an independent life when it grows up and becomes able to lead an independent life.

(2) (1) Paddy crop production will go down as the population of grasshoppers will increase and they will damage the paddy crops.
(2) If the frog population decline, the primary consumers (grasshopper) population will increase and the tertiary consumers (snakes) will decline.
(3) The natural balance of the ecosystem will be disturbed. The food chain will get affected.

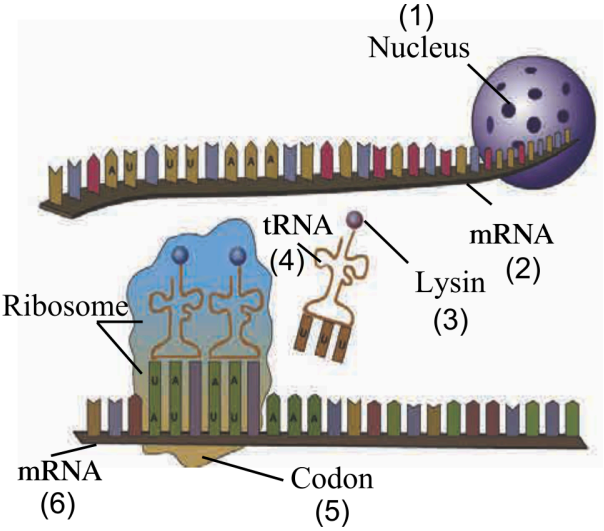
(3) i. The morphological changes occurring in living organisms are responsible for evolution and the reason behind those morphological changes is activities or laziness of that organism. This concept is called as principle of 'use or disuse of organs'.
ii. The neck of giraffe has become too long due to browsing on leaves of tall plants by extending their neck for several generations. Wings of birds like ostrich and emu have become weak due to no use.

(4) (i) Deoxyribose sugar, phosphoric acid and pairs of nitrogenous bases are the components of the DNA molecule.
(ii) Brain, stomach, intestine, liver, kidney, lungs, heart etc. are the different organs in body of organisms.
(iii) Yes, every organ has its own importance.

(5) i. Numerous species of plants and animals have become extinct due to the various human activities over many years.
ii. Humans have killed animals for fun, for trade and medicines. Thus making these animals extremely vulnerable or endangered or extinct.
iii. Animals and plants are the source of income to certain set of people and hence, poaching takes place, resulting in threats to the existence of animals and plants.
iv. Deforestation results in extinction of plant species thus affecting the ecosystem of that place.
v. Different types of pollution at different levels are also responsible for endangering of species.
vi. We can still save the remaining species of plants and animals. And efforts are carried out by various people and organization in that direction.
vii. Various methods like environmental education, awareness programs, implementation of strict rules, etc.

can help prevent the loss of varieties of plants and animals.

(6)



(7) (i) Deoxyribose sugar, phosphoric acid and pairs of nitrogenous bases are the components of the DNA molecule.

(ii) Brain, stomach, intestine, liver, kidney, lungs, heart etc. are the different organs in body of organisms.

(iii) Yes, every organ has its own importance.

(8) i. For formation of plasma membrane, Phospho lipids molecules are necessary.

ii. The lipids break down to form fatty acids and alcohol after digestion.

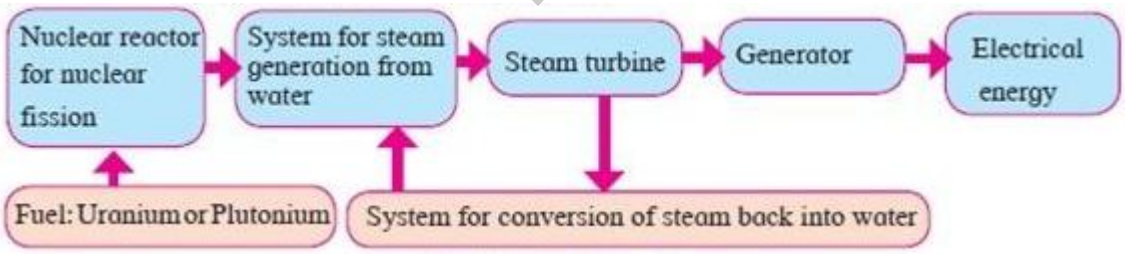
iii. Fatty acids are absorbed up and distributed everywhere within the body.

iv. From these fatty acids different cells produce various substances necessary for themselves.

v. For example: the molecules called as phosphor lipids which are essential for producing plasma membrane are formed from fatty acids.

Q4)

(1) In the power plant based on nuclear energy, steam turbine is used to rotate the generator. However, here the energy released by fission of nuclei of atoms like uranium or plutonium is used to generate the steam of high temperature and high pressure. The energy un the steam rotates the turbine, which in turn drives the generator producing electricity. The flow chart of nuclear power plant is shown below:



Nuclear Power Plant

Thus, here nuclear energy is converted into thermal energy, thermal energy is converted into kinetic energy of steam is converted into kinetic energy of turbine and finally the kinetic energy of the turbine is converted into electrical energy. The step by step transformation of energy is shown in figure:

Nuclear energy → Thermal energy → Kinetic energy in steam → Kinetic energy in turbine → Electrical energy

Energy transformation in nuclear power plant

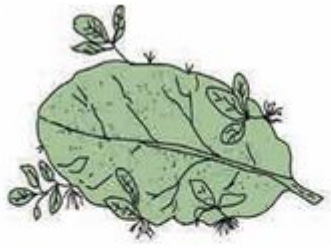
(2) i. Asexual reproduction in plants is known as vegetative reproduction which takes place with the help of vegetative parts like root, stem, leaf and bud.

ii. Vegetative propagation in potatoes is performed with the help of eyes present on tuber whereas in Bryophyllum it is performed with the help of buds present on leaf margin.

iii. In case of plants like sugarcane and grasses, vegetative propagation occurs with the help of buds present on nodes.

iv. Plants like carrot and radish perform vegetative propagation with the help of roots.

Sweet Potato



Bryophylum

Potato

All the Best