

Solution

SCIENCE-2

Class 10 - Science & Technology - II

1. (i) Write the correct alternative:

i. (c) 9 kcal

Explanation:

9 kcal

ii. (c) Eagle

Explanation:

Eagle

iii. (c) Mammalia

Explanation:

Mammalia

iv. (c) cancer

Explanation:

cancer

v. (a) Geological

Explanation:

Geological

(ii) Answer the following questions as per the given instructions:

i. War

ii. (a) True

Explanation:

True

iii. Bat belongs to class Mammalia.

iv. Coal is used as fuel in thermal power plant.

v. Full form of WHO is World Health Organisation.

2. (i) Give scientific reasons. (Any 2)

i. i. While exercising the muscle cells perform anaerobic respiration.

ii. During anaerobic respiration in muscle cells, lactic acid accumulates in the body.

iii. Lactic acid accumulation is a result of the process of fermentation during which glucose is broken down by anaerobic respiration, forming organic acids.

iv. Also, the production of ATP is comparatively less during anaerobic respiration.

Hence, a person may get tired on quick exercise.

ii. i. Large amount of energy is generated in a matter of seconds in a fission reaction. If the fission reaction is not controlled, it can prove fatal.

ii. Uncontrolled fission reaction may lead to the emission of harmful radiations.

iii. It can also lead to the meltdown of the nuclear power plant.

Thus, it is absolutely necessary to control the fission reaction in nuclear power plants.

iii. i. Family planning is the practice of controlling the number of children one has and the intervals between their births.

ii. India is currently facing the problem of population explosion.

iii. The population explosion may lead to overconsumption of natural resources and may affect the environment indiscriminately. This may lead to increase in poverty, illiteracy, etc.

Hence, Indians should follow family planning for controlling the population.

(ii) Answer the following questions (Any 3)




i. Objections raised against Darwin's theory of natural selection:

a. Natural selection is not the only factor responsible for evolution.

- b. In his theory, Darwin did not explain the inheritance of useful and useless modifications.
 - c. No explanation regarding slow and abrupt changes was provided in this theory.
- ii.
 - i. Mr. Molai single handedly transformed a barren land into forest.
 - ii. It was due to his positive attitude, affection towards nature and hard work, that he could achieve success in planting trees, in over 1360 acres of land.
 - iii. From the story of Jadav Molai Payeng we learn that, we all need to make Earth a better place to live for us as well as for the coming generations.
 - iv. From his story, it is clear that if a large crowd causes harm to the environment, even a single person, if determined can establish a forest and benefit the environment in great ways.
 - v. Also, if one person can make such an impact, many people coming together in unity to take efforts for environment conservation can bring about a revolution.
- iii.
 - i. Childless couples can have a child with the help of advance medical techniques like surrogacy, sperm bank and IVF.
 - ii. Women having problems with implantation of the embryo in the uterus can have a child with the help of surrogacy technique. In this technique, oocyte is collected from the concerned woman and fertilized in a test tube with the help of sperms collected from her husband. Embryo formed from fertilization is implanted in another woman (surrogate mother), having a normal uterus.
 - iii. In sperm banks, semen is collected from the sperm donors after their physical and medical checkup and stored. Semen sample from the sperm bank is used to fertilize the oocyte of the female partner of the concerned couple. The resultant embryo is implanted in the uterus of the same woman. Couples, in which males have problems in sperm production, can have a child with the help of this technique.
 - iv. Childless couples having problems like less sperm count, obstacles in oviduct, etc., can use IVF technique. In this technique, fertilization is brought about in the test tube and the embryo formed is implanted in the woman's uterus at an appropriate time.
- iv.
 - i. Balanoglossus belongs to phylum Hemichordata.
 - ii. It possesses certain characteristics of both Chordates and Non-chordates.
 - iii. Absence of vertebral column or spinal cord and a worm-like body are the Non-chordate like characteristics seen in Balanoglossus.
 - iv. Presence of notochord, pharyngeal gill slits are some Chordate-like characters seen in Balanoglossus.

Hence, Balanoglossus is considered as a connecting link between Non-chordates and Chordates.
- v. Vitamins:
 - i. Vitamins are a group of heterogenous compounds which are essential for the proper operation of various life processes.
 - ii. The two types of vitamins are fat-soluble vitamins and water-soluble vitamins.

3. Answer the following questions (Any 5):

(i)			
Symbol			
Meaning	Reduce, Reuse, Recycle	Save Water	Renewable Solar energy/Renewable energy source
Role	Recycle and reuse materials in order to reduce waste	Do not waste water, check leakages and promote rain water harvesting	Switch to solar energy, use renewable source of energy to prevent depletion of non-renewable energy sources

- (ii)
 - a. **Asymmetrical body:** In this type of symmetry, there is no such imaginary axis of the body through which we can get two equal halves. e.g. Amoeba, Paramecium, some sponges.
 - b. **Radial symmetry:** In this type of symmetry, if an imaginary cut passes through the central axis of any plane of the body, it gives two equal halves. e.g. Starfish.

In starfish, there are five different planes passing through the central axis of the body, through which we can get two equal halves.

- c. **Bilateral symmetry:** In this type of symmetry, there is only one such imaginary axis of the body through which we can get two equal halves. e.g. Insects, fishes, frog, birds, human, etc.
- (iii) i. Milk is used to produce cheese. In cheese production, microbes like *Lactobacillus lactis* and *Streptococcus thermophilus* are mixed with milk.
- ii. Enzyme rennet obtained from alimentary canal of cattle used traditionally in the production of cheese.
- iii. An enzyme protease obtained from fungi is used to produce vegetarian cheese.
- (iv) i. The process shown in diagram is stem cell therapy.
- ii. Stem cells can be transformed into other types of cells. The organs generated using stem cells can be used for organ transplantation.
- iii. Stem cells may develop into neurons, brain, intestines, liver, heart and bone.
- (v) Starfish can regenerate its broken body part.
- Explanation:
- a. Regeneration is the natural process of replacing or restoring damaged or missing cells, tissues, organs, or even entire body parts of organisms.
- b. Starfish belongs to the phylum Echinodermata, whereas the cockroach belongs to the phylum Arthropoda, and the frog and sparrow belong to the phylum Chordata.
- c. Most of the organisms belonging to the phylum Echinodermata have good ability of regeneration.
- (vi) i. The given figure shows the process of waste disposal in modern landfill site.
- ii. a. In this method of waste disposal, large pits are dug in an open area.
- b. These pits are lined with plastic sheets to prevent soil pollution caused by leaching of toxic and harmful substances into the soil.
- c. The compressed degradable waste is dumped into the pit and covered with layers of soil, sawdust, leafy waste, specific biochemicals and sometimes the bioreactors are mixed for better aeration. This completely filled pit is sealed with soil slurry.
- d. Microbes present in soil and other layers decompose the waste. As a result, best quality compost is obtained after few days which can be removed and such sites can be reused.
- (vii) i. Anatomical evidences are the similarities in structures and anatomy between different organisms.
- ii. The hand of human, foreleg of ox, flipper of whale and forelimbs of bat appear different superficially or morphologically.
- iii. Also, the function of these structures is different in different animals.
- iv. However, there is a similarity in the structure of bones and bony joints in the organs of these animals.
- v. These similarities indicate that the animals evolved from a common ancestor thus providing proof of evolution.
- (viii) i. The given diagram is of wind turbine (wind mill).
- ii. Wind is the source of energy in this project.
- iii. The energy source (wind) is never-ending. The use of wind energy does not lead to environment problems. Hence, this source of energy can be called ecofriendly.

4. Answer any one of the following questions:

- (i) i. The tissues of degenerating endometrium along with unfertilized ovum and blood are discarded out through vagina. This bleeding continues approximately for 4-5 days. This period is known as period of menstruation.
- ii. Ovulation usually occurs on 14th day of menstrual cycle.
- iii. Reproductive organ that undergo changes during menstrual cycle: Uterus.
- iv. Period of regeneration of endometrium: After the period of menstruation, i.e., on 5 th day of menstrual cycle.
- v. Period of secretions of glands in endometrium: It is the phase between ovulation and beginning of the next menses. This phase is the longest phase. It lasts for 14 days i.e., from 15th to 28th day of the cycle.
- (ii) i. a. Save water
It is necessary to save every drop of water for the survival of our future generations. Without the conservation efforts, the vital water supply may be exhausted.
- b. Save fuel
We need to save fuel by opting for ecofriendly transport. This will also help to reduce pollution generated by burning of fossil fuels.
- ii. Biodiversity can be conserved by following ways:
- a. Conservation of all plants and animals.

- b. Protection of rare species of organisms.
- c. Projects for conservation of special species.
- d. Establishment of national parks and sanctuaries.
- e. Declaration of some regions as bioserves.
- f. Maintenance of records of traditional knowledge.
- g. Obey the rules that fall under Biodiversity Act.

SATISH SCIENCE
ACADEMY