

Time : 2 Hrs.

Marks : 40

Q.1 A) Multiple choice Questions.

- 1) c) halved 2) a) Cnidarians 3) d) all of the above 4) b) ovum 5) b) Nervous

B) State True or False.

- 1) Wrong- Muscle cells perform anaerobic respiration while exercising.
- 2) Right
- 3) Wrong- Solar photovoltaic cell, solar energy is directly converted into electrical energy.
- 4) Right
- 5) Right

Q.2 A) Give scientific reasons. – (Any 2)

- 1)
 - i) The animals like dog, sheep and wolf resemble each other in various morphological features.
 - ii) They possess similarities in structure of Mouth, position of Eyes, structure of nostrils and ear pinnae and thickly distributed hair on body.
 Hence, morphological evidences provide proof that dog, sheep and wolf share a common origin.
- 2)
 - i) Pollution affects the environment adversely.
 - ii) Environmental pollution is a major concern because of the harmful effects it has on the environment as well as on health of humans.
 - iii) The impact of pollution is severe in developing countries, leading to ill health, death and disabilities in people. Develop countries have powerful ways of environmental management as they have resources as well as technologies to combat pollution.
 - iv) Reducing pollution will help reduce production of toxic wastes, thereby saving the cost of disposal of wastes.
 - v) The ultimate effect of pollution is on the existence of living organisms.
 - vi) We as stake holders of the environment need to come together to overcome pollution. It will preserve our precious environmental resources and improve the environment quality. Thus, overcoming pollution is a powerful way of environmental management.
- 3) If I find that the child of my neighbor is addicted to tobacco chewing:
 - i) I will make him aware about the health problems associated with chewing tobacco like mouth cancer, tooth decay, gum diseases, etc. this will help him to make decisions about quitting tobacco.
 - ii) I will advise him to reduce the use of tobacco everyday till he finally quits it completely.
 - iii) I will also make him talk to his family or friends regarding the issue, so as to help him get rid of the habit.

B) Answer the following. – (Any 3)

- 1)
 - i) The $NADH_2$ and $FADH_2$ molecules formed during glycolysis and tricarboxylic acid cycle, participate in the electron transport chain, which occurs in the mitochondrion.
 - ii) Each molecule of $NADH_2$ yields of 3 molecules of ATP.
 - iii) Also, each molecule of $FADH_2$ yields of 2 molecules of ATP.
- 2) Radioactive pollution may result in cancerous ulcerations due to exposure to high radiation of X-Rays, destruction of tissues of the body, changes in genetic constitution, adverse effect on vision, etc.
- 3) Based on body symmetry, animals can be classified into three groups;
 - i) 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.
 - ii) radial symmetry; In this type of symmetry, if an imaginary cut passes to central axis of any plan of the body, through which we can get two equal halves.
 - iii) 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.
- 4) The steps involved in the production of cheese once the whey is separated from yoghurt into:
 - i) Cutting the solid yoghurt into pieces.
 - ii) Washing

- iii) Rubbing
- iv) Salting
- v) Mixing of essential microbes, pigments and flavors.
- vi) Pressing the cheese and cutting them into pieces.
- vii) Storing for ripening.

- 5) i) The Disaster Management Act which was passed in 2005, deals with effective management of disasters.
- ii) According to this act, an authority has been established at the government level to control and coordinate the disaster management from the national to village level.
- iii) District, Taluka or village authorities are directly involved in search, rescue and rehabilitation work.
- iv) As per this act, national disaster response force (NDRF) has been established for responding appropriately to different types of disasters.

Q.3 Answer the following. – (Any 5)

1) Transcription

- i) Transcription is the process of synthesis of mRNA from DNA. It takes place in the presence of RNA polymerase.
- ii) During transcription mRNA is produced as per the sequence of nucleotides present on the DNA.
- iii) This mRNA sequence is always complementary to the DNA strand that is used for its synthesis.
- iv) The thymine in DNA molecule is replaced by uracil in RNA, during the process of transcription.

2) i) The cell organelle shown in the diagram is mitochondrion.

- ii) Energy rich molecules such as ATP, $NADH_2$ and $FADH_2$ are synthesized during krebs cycle.
- iii) The compound 'X' produced during glycolysis is pyruvic acid.

3) i) Biodiversity is the richness of living organisms in nature due to presence on varieties of organisms, eco system and genetic variations within a species.

ii) Biodiversity occurs at three different levels.

a) Genetic Diversity: It refers to the occurrence of diversity among organisms of same species. E.g. each human being is different from other.

b) Species Diversity: It refers to innumerable species of organisms that occur in nature e.g. variety of plant, animals, microbes.

c) Eco system diversity; it refers to variations in eco system present in nature. These eco systems are formed by the interaction between plant, animals there habitants and changes in the environment. Each eco system has its own biotic (animals, plants, microbes) and abiotic factors.

iii) In recent times, the bio diversity is threaten and special efforts need to be taken in order to conserve bio diversity.

4) i) Members of class Pisces are poikilothermic (cold blooded).

ii) They are marine or fresh water animals.

iii) They have a spindle shaped body to minimize water resistance.

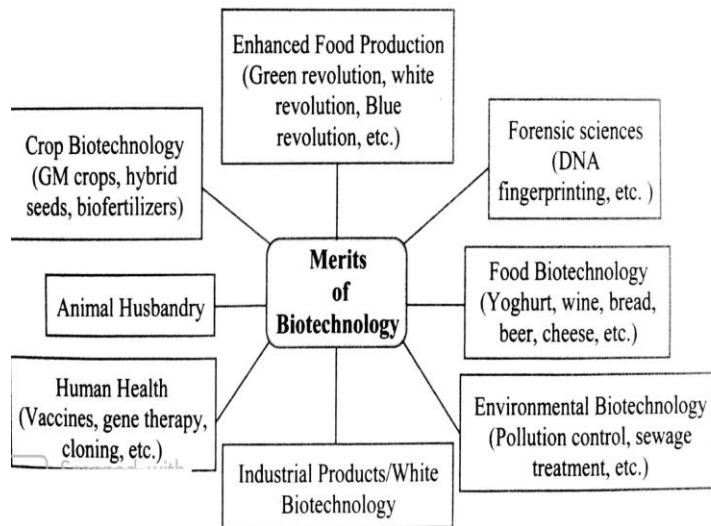
iv) They have paired or unpaired fins for swimming. Tail fin is used as a steering organ during swimming.

v) Exoskeleton is in the form of scales and endoskeleton is either bony or cartilaginous.

vi) Respiration takes place through gills e.g Rohu, Pomfret, sea horse , shark, electric ray, sting ray, etc.

- 5) For preparation of yoghurt, milk is boiled and once it cools to warm temperature, bacteria such as *Lactobacillus delbrueckii* **Streptococcus thermophilus** and are added to it in 1:1 proportion. **Lactic acid** is formed due to Streptococcus that makes the protein to gel out and thus give **dense consistency** to the yoghurt. Acetaldehyde like compounds are formed due to **Lactobacilli** that gives **characteristic taste** to the yoghurt.

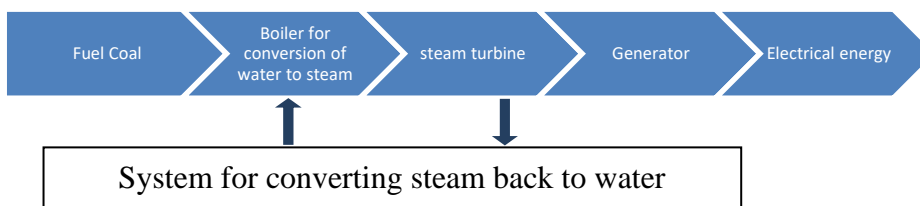
6)



- 7) i) Hacking of information of government, institutes and companies through internet.
ii) Teasing and financial exploitation of people through social media.
iii) Piracy of software, literature, photos, videos, music, etc. obtained from internet.
iv) Bank transactions carried out using PIN without the knowledge of consumers.
v) Selling of inferior quality items than those shown on shopping websites.
vi) Misuse of electronic media for sending derogatory messages, circulating vulgar pictures and inflammatory statements.
vii) Spreading of unwanted messages or emails which can impair or lead to shutdown of mobiles and computers.
- 8) i) Mock drill is conducted to check the preparedness of the people in a locality, premise or building to face a disaster.
ii) It helps to judge the efficacy of the system prepared for disaster redressal.
iii) A virtual situation of disaster is created to check the reaction time for any type of disaster.
iv) Every mock drill is observed and supervised by trained personnel who check the execution of plan designed for disaster redressal.
v) For example, fire mock drills are arranged in various schools by fire fighters, which includes demonstration like extinguishing the fire, rescuing the people trapped at higher floors of buildings, rescuing the person whose clothing have caught fire, etc.

Q.4 Answer the following. – (Any 1)

- 1) i) Pollen grain ii) Male gametes iii) Ovules iv) Polar nuclei
i) The pollen tube bursts and releases two male gametes in the embryo sac.
ii) One male gamete fuses with the egg cell to form zygote, whereas the second male gamete fuses with two polar nuclei in the embryo sac to form endosperm.
iii) Since, in flowering plants the process of fertilization occurs twice in the same embryo sac, by two male gametes, it is called as double fertilization.
- 2) a) The schematic of thermal power plant is shown in the given diagram.
b) Coal is the fuel used in thermal power plant.
c) In thermal power plant, coal is burned which causes air pollution.
d) The flow chart showing the generation of electricity in thermal power plant is as follows:



- e) The flow chart for the transformation of energy in thermal power plant is as follows :

