

Time : 2 Hrs.

Marks : 40

Q.1 A) Multiple choice questions.

- 1) (C) Reproduction 2) (B) Octopus 3) (D) All of the above 4) (A) oxidation
5) (D) Poisonous gas leak

B) Complete the Analogy.

- 1) **Amino acids** –
Lipids are broken down into fatty acids and glycerol, whereas proteins are broken down into amino acids.
- 2) **Sessile flower** –
Flowers with stalk are called pedicellate flower, whereas flowers without stalk are called sessile flowers.
- 3) Group of solar cells: solar panel : : Group of solar strings : **Solar array**.
- 4) **Itaconic acid** –
Lactic acid is obtained by using *Lactobacillus delbrueckii*, whereas itaconic acid is obtained by using *Aspergillus itaconius*.
- 5) **Somatostatin** –
Factor VIII is used for treating conditions like hemophilia, whereas somatostatin is used for treating dwarfism.

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

- 1) i) Sudden development of new tissues or organs is not possible for the purpose of living in changing environment.
ii) The existing organs of an organism undergo gradual changes and may become useless or harmful under certain conditions.
iii) Such structures begins to degenerate, as per the principle of natural selection.
iv) These organs take thousands of years of disappear. Hence they may appear in different phase of disappearance in different animals.
Hence, even though appendix is a vestigial organ, it is still existent in human beings.
- 2) i) Pollution affects the life of human beings and other living organisms. Also, it affects other natural elements like air, soil, water, etc.
ii) Persistence of pollutants in nature has adverse effects on human health and environment.
iii) Anthropogenic activities like mining, etc., have negative impact on the ecosystem, biodiversity, natural resources and habitats.
iv) Pollution leads to loss of biodiversity, global warming, reduction in number of plant and animal species, etc.
v) Human health is largely impacted by degradation of environment. Reduction in quantity of air, water and other resources poses a threat to human life.
Hence, pollution control is extremely important.
- 3) Increased stress can result in various adverse effects on physical, mental as well as social health of an individual.
If I find that my brother studying in XII has developed stress.
i) I will talk with him and try to understand whether the stress is due to studies.
ii) I will also help him in preparing timetable for his studies so that he gets time for relaxation and some leisure along with studies.

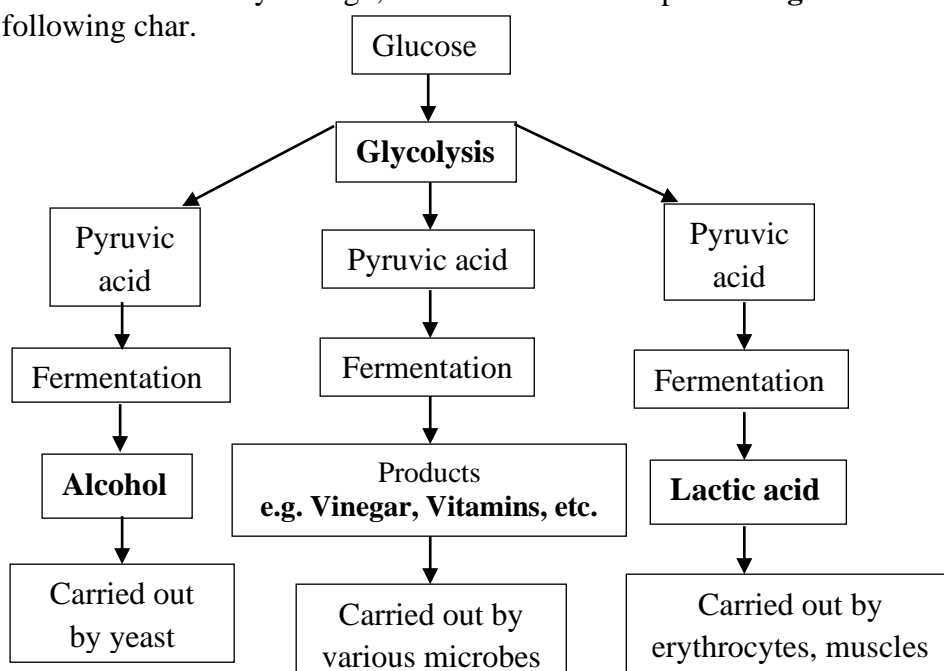
B) Answer the following. (Any 3)

- 1) ATP (Adenosine triphosphate), FADH₂ (Flavin adenine dinucleotide), NADH₂ (Nicotinamide adenine dinucleotide), CO₂ and H₂O
- 2) i) In 1731, Amrita Devi Bishnoi along with other 363 Bishnois sacrificed their lives for the protection of 'Khejri' trees in Khejarli village near Jodhpur in Rajasthan. These trees were being harmed for construction of a new palace.

- ii) Bishnois were dependent on various forest products for their survival.
 iii) Amrita Devi and other Bishnois showed courage by embracing the trees to protect them.
 iv) The Government of India has recently instituted 'Amrita Devi Bishnoi National Award' for protection of wildlife.
- 3) i) The members of class Aves are completely adapted for aerial life.
 ii) They are homeotherms i.e. they can maintain a constant body temperature.
 iii) Their body is spindle- shaped, to reduce air resistance during flight.
 iv) Forelimbs are modified into wings. Digits are provided with claws and are covered with scales.
 v) Jaws are modified into beak.
 vi) Neck is present between the head and trunk.
 vii) Exoskeleton is in the form of feathers.
 For e.g. Peacock, parrot, pigeon, duck, penguin, etc.
- 4) The reasons for increasing the popularity of probiotic products are as follows:
 i) Probiotics are healthy foodstuffs which contain active bacteria such as *Lactobacillus acidophilus*, *Lactobacillus casei*, *Bifidobacterium bifidum*, etc.
 ii) These microbes form colonies of useful microbes in the alimentary canal and maintain the balance of beneficial intestinal micro- organisms that help in digestion, and decrease the population of harmful microbes such as *Clostridium*.
 iii) They also improve resistance and lower the ill effects of harmful substances formed during metabolic activities.
 iv) When we take antibiotics, the useful microbes in alimentary canal become inactive. These microbes in alimentary canal become inactive. These microbes can be made active by consuming probiotics.
 v) Also, probiotics are used for treatment diarrhea and treatment of poultry diseases.
- 5) (i - c), (ii - d), (iii - b), (iv - a) Third answer incorrect please check

Q.3 Answer the following. (Any 5)

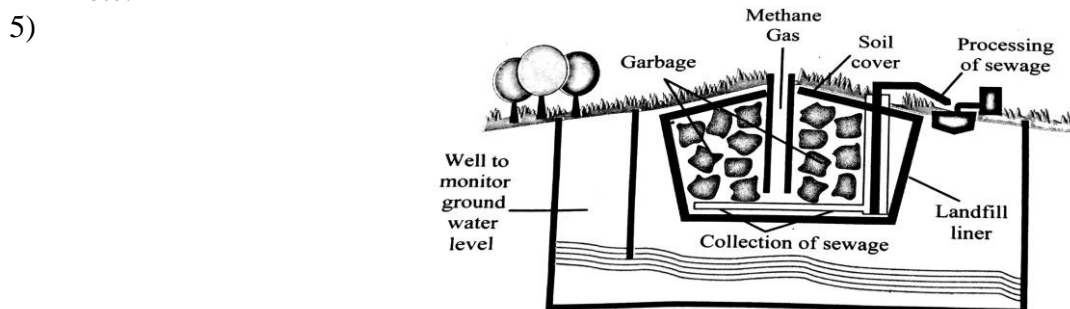
- 1) Fill in the blanks by selecting the correct word from the bracket and complete the given paragraph.
 (two, Ramapithecus, modern sciences, seven, Neanderthal man, lemurs, agriculture, orangutans)
 The last dinosaurs disappeared approximately seven crore years ago. Monkey – like animals are said to have evolved from some ancestors who were similar to modern **lemurs**. The first human – like animals with erect posture evolved about **two** crore years ago. The first record of this human – like ape is **Ramapithecus** from East Africa. **Neanderthal man** can be considered as the first member of the class – wise - man. About 10 thousand years ago, wise – man started to practice **agriculture**.
- 2) Complete the following char.



- 3) i) Bombay Natural History Society, Mumbai.
 ii) C.P.R. Environmental Education Centre, Chennai.
 iii) Gandhi Peace Foundation Environment Cell, Delhi.
 iv) Chipko Information Centre, Tehri Garhwal.

- v) Centre for Environment Education, Ahmedabad.
- vi) Kerala State Council for Science, Technology and Environment.
- vii) Bharatiya Agro Industries Foundation, Pune.
- viii) Vikram A Sarabhai Community Science Centre, Ahmedabad.

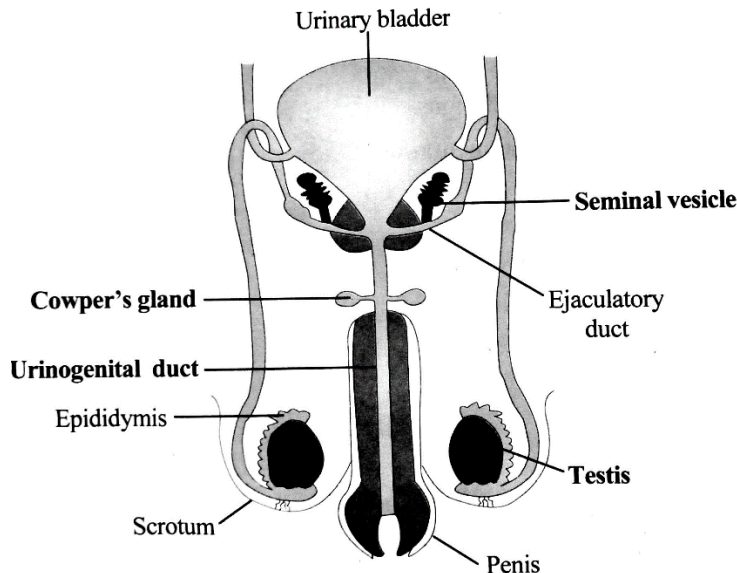
- 4) i) Members of class Pisces are poikilothermic (cold- blooded).
 ii) They are marine or fresh –water animals.
 iii) They have a spindle – shaped body to minimize water resistance.
 iv) They have paired or unpaired fins for swimming. Tail fin is used as a steering organ during swimming.
 v) Exoskeleton 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.



- i) Landfill sites are located away from the residential area.
- ii) In this method of waste disposal, large pits are dug in an open area.
- iii) These pits are lined with plastic sheets to prevent soil pollution caused by leaching of toxic and harmful substances into the soil.
- iv) The compressed degradable waste is dumped in to the pit and covered with layers of soil, sawdust, leafy waste, specific biochemical and sometimes the bioreactors are mixed for better aeration. This completely filled pit is sealed with soil slurry.
- v) 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.
- 6) i) Biotechnology plays an important role in the identification of genes that cause disease in humans.
 ii) Due to biotechnology faster diagnosis of diseases like diabetes. AIDS and dengue is possible sometimes even before the onset of symptoms.
 iii) For the treatment of diseases like diabetes, insulin is produced by inserting the insulin producing gene into the genome of bacteria, using biotechnological techniques.
 iv) Vaccines, interferons and antibiotics are produced against specific pathogens or diseases. \
- v) Gene therapy is used to treat genetic disorders in somatic cells and germline cells.
 vi) Using therapeutic cloning stem cells or genes can be cloned in order to treat hereditary diseases.
- 7) i) The changes that occur in a home having a chronically ill old person are as follows:
 a) Other members of the house become more alert about health related issues.
 b) They tend to maintain extreme cleanliness in the house.
 c) The ambience in the house is stressed at every moment.
 ii) In order to maintain good atmosphere in such a situation one can do the following things:
 a) Increase communication among the members of the family so as to keep everyone connected.
 b) Take care that the needs of other members of the house are not neglected while dealing with the chronically ill old person.
 c) Help by doing small chores like bringing medicines, etc.
- 8) i) Terrorism : Intentional, man- made disaster
 ii) Soil Erosion : Geological disaster
 iii) Hepatitis : Biological disaster caused by viruses.
 iv) Forest fire : Biological disaster related to plants. It can also be classified as man – made disaster in certain cases.
 v) Famine : Dry famine or drought is a type of atmospheric, geophysical disaster.
 vi) Theft: Intentional, man – made disaster.

Q.4 Answer the following. (Any 1)

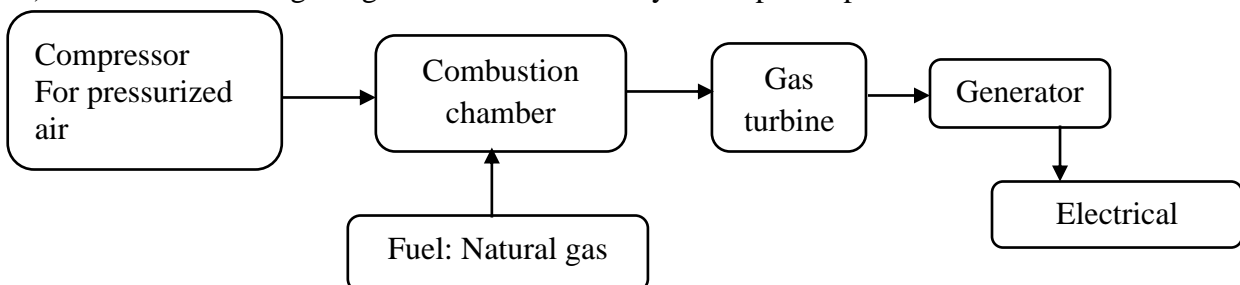
1)



- i) Testes contain numerous seminiferous tubules.
- ii) Germ cells present in the tubules divide by meiosis to produce sperms.
- iii) Sperms undergo physiological maturation, and their motility as well as the fertilizing capacity is increased in the head of epididymis.
- iv) These sperms move forward sequentially through tubules – rete testes, vasa efferentia, epididymis, vas deferens, ejaculatory duct and urinogenital duct.
- v) As these sperms reach the urinogenital duct, they are ejaculated out through penis.

2)

- i) The schematic of power generation based on energy of natural gas is shown in the given diagram.
- ii) The combustion chamber is used to burn the natural gas in the presence of pressurized air.
- iii) The compressor is used to introduce pressurized air in the combustion chamber.
- iv) Flow chart showing the generation of electricity in the power plant is as follows:



- v) Flow char showing the transformation of energy in the power plant is as follows:

