SOLUTION — MARCH 2024

Q. 1. (A) Choose and write *correct* option number as answer :

(i) Regeneration occurs in .....

(A) amoeba *(B) paramoecium*

(C) euglena *(D) planaria*

(ii) *Lactobacillus brevis* gives us the beverage .....

(A) cocoa *(B) coffee*

(C) wine *(D) cider*

(iii) A minor change occurs due to change in position of any nucleotide is termed as .....

(A) transcription *(B) translocation*

(C) mutation *(D) translation*

(iv) Atomic power plant in Maharashtra is at .....

(A) Chandrapur *(B) Koyna*

(C) Tarapur *(D) Anjanwel*

(v) Example of phylum Arthropoda is .....

(A) scorpion *(B) starfish*

(C) earthworm *(D) hydra*

Ans. (i) (D) (ii) (B) (iii) (C) (iv) (C) (v) (A).

Q. 1. (B) Solve the following :

(i) Pick the odd man out :

duckbill platypus, pomfret, lungfish, peripatus.

Ans. pomfret

(ii) Write correlation :

Skin : Melanin : : Pancreas : .....

Ans. Insulin/trypsin

(iii) State true *or* false :

Production of various useful aquatic organisms with the help of water is called blue revolution.

Ans. True

(iv) Write full form of WHO.

Ans. World Health Organization

(v) Match the pair :

'A'	'B'
Male	(A) 44 + XX
	(B) 44 + XY
	(C) 44 + YY

Ans. (B) 44 + XY

Q. 2. (A) Give scientific reasons :

(i) Though tortoise lives on land as well as in water, it cannot be included in class Amphibia.

Ans. (1) When amphibians lives on the land, they respire with the help of lungs and in water they respire with the help of skin.

(2) When tortoise lives on the land, it respires with the help of lungs. When in water, it puts out its nares (nasal opening) out of the water and breathes air.

(3) That means in both the habitats, it respires with the help of lungs. It is not happened in the case of true amphibians.

(4) Tortoise also has exoskeleton which is lacking in amphibians.

Therefore, tortoise cannot be included in class Amphibia.

(ii) Hydroelectric energy, solar energy and wind energy are called renewable energies.

Ans. (1) Hydroelectric energy, solar energy and wind energy are obtained respectively from flowing water, solar radiations and flowing wind.

(2) These sources i.e. water reservoirs, Sun and the wind are inexhaustible and sustainable.

(3) They will not be finished.

(4) They can be replenished.

Hence, Hydroelectric energy, solar energy and wind energy are called renewable energies.

(iii) We feel tired after exercise.

Ans. (1) When we undertake constant exercise, there may be shortage of oxygen for the cells. Therefore, our muscles and other tissues perform anaerobic respiration in such condition.

(2) In this process, lactic acid is formed.

(3) Molecules of ATP produced in oxidation of food are also much less.

(4) Thus, there is less energy in the body and accumulation of lactic acid too.

All this brings out about a feeling of exhaustion.

Q. 2. (B) Answer any *three* of the following :

(i) Write *four* adverse effects of radiations on human body.

Ans. Adverse effects of radiations on human body as follows :

(1) Cancerous ulceration occurs due to higher radiations of X-rays.

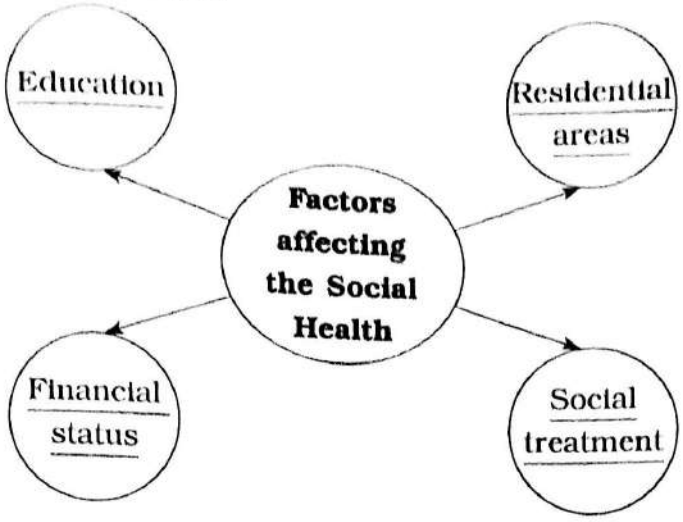
(2) Radiations destroy the body tissues.

(3) Radiations cause mutations and thus genetic changes occur.

(4) Vision is adversely affected.

(ii) Redraw and complete the given chart :

Ans. *(Answers are underlined)*



(iii) Write any *four* important facts which must be thought over while considering the scope of disaster.

Ans. Taking into consideration the scope of disaster, some of the important facts which must be thought over are as follows :

(1) Pre-disaster phase (2) Warning phase. (3) Emergency phase (4) Rehabilitation phase (5) Recovery phase (6) Reconstruction phase

(iv) Name *two* fuels obtained by microbial processes. Why is it necessary to increase the use of such fuels?

Ans. (1) Methane, Ethanol, Hydrogen gas can be obtained by microbial processes.

(2) It is necessary to increase the use of such fuels because :

(A) The fuels obtained by the microbial processes are clean (smokeless), hence do not cause pollution.

(B) These are reliable fuels of the future.

(C) These fuels are easily available and in plenty of quantity.

(v) What is DNA fingerprinting? Where is it mainly useful?

Ans. (1) As the fingerprints are unique for every individual, similarly the nucleotide sequence in the DNA molecule is also unique. By knowing this sequence, one can find out the identity of any person. Such technique is called DNA fingerprinting.

(2) Its main use is in forensic sciences to confirm the identity of the criminal.

(3) Similarly, identity of parents in case of disputed parentage for any child can be understood by taking DNA fingerprints of both the parents and a child.

Q. 3. Answer any *five* :

(i) (A) What are vitamins?

Ans. Vitamins are a group of heterogeneous compounds essential for proper functioning of the body.

(B) Classify them according to their solubility.

Ans. Classification of vitamins according to their solubility :

(1) Fat soluble vitamins. (2) Water soluble vitamins.

(C) Give *one* example of each type as per above classification.

Ans. Fat soluble vitamins : A, D, E, K.

Water soluble vitamins : B, C.

(ii) Explain the following terms :

(A) Stem cells

Ans. Stem cells :

(1) The special cells having pluripotency and ability to divide and differentiate into new cells are called stem cells. They are present in multicellular living beings.

(2) Depending upon source, stem cells are of two types as embryonic stem cells and adult stem cells.

(B) Cloning

Ans. Cloning :

(1) Production of replica of any cell or organ or entire organism through biotechnological process is called cloning.

(2) There are two types of cloning, viz. (i) Reproductive cloning (ii) Therapeutic cloning.

(C) Genetically modified crops

Ans. Genetically modified crops :

(1) Crops having desired characters are developed by integrating foreign gene with their genome, such crops have modified genome and are known as genetically modified crops.

(2) Examples : Bt cotton, Bt Brinjal, Golden Rice.

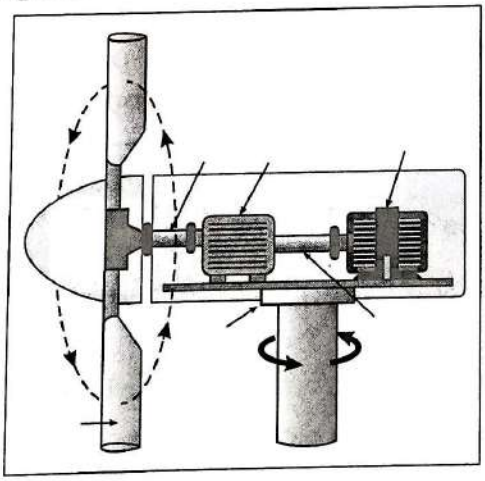
(iii) Complete the given paragraph by filling the blank spaces from the options given in the brackets :

(oxygen, pyridines, mechanical, CO_2, petroleum, fatal, polyester, norcadia)

Ans. *(Answers are underlined)*

Spilling of petroleum oil occurs in ocean due to various reasons. This oil may prove fatal and toxic to aquatic organisms. It is not easy to remove the oil layer from surface of water by mechanical method. However, bacteria like *Pseudomonas* spp. and *Alcanovorax borkumensis* have the ability to destroy the pyridines and other chemicals. Hence, these bacteria are used to clear the oil spills. These are called as hydrocarbonoclastic bacteria (HCB). HCB decompose the hydrocarbens and bring about the reaction of carbon with oxygen, CO_2 and water is formed in this process.

(iv) Observe the given picture and answer the questions :



Questions :

(A) Identify the given diagram.

Ans. Schematic of wind mill is shown in the given diagram.

(B) What is the source of energy in this project?

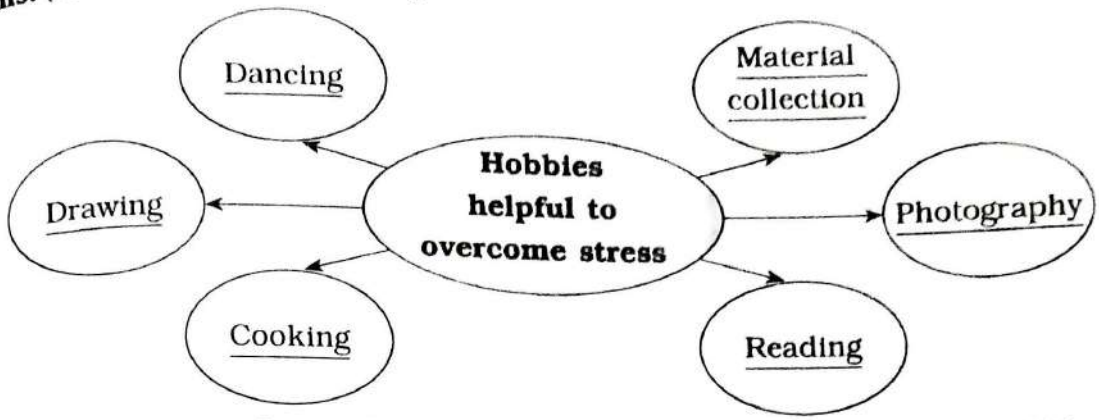
Ans. The kinetic energy of wind is the source of energy in this project.

(C) Why this source is supposed to be ecofriendly?

Ans. This source is eco-friendly because it does not cause pollution. Wind energy is green energy which is non-exhaustible, perpetual and sustainable.

(v) Complete the following chart :

Ans. *(Answers are underlined)*



(vi) Write names of any *six* materials which are to be in the first aid box.

Ans. The necessary material which are to be in the first aid box :

(1) Bandage strips of different size (2) Wound gauze (3) Medicated cotton (4) Hand gloves (5) Soap (6) Clean and dry cloth pieces (7) Antiseptic (Dettol/Savlon) (8) Safety pins (9) Blade (10) Needle (11) Band aid (12) Scissor (13) Thermometer (14) Petroleum jelly.

(vii) (A) Define vestigial organs.

Ans. Vestigial organs are degenerated or underdeveloped organs of organisms which do not perform any function.

(B) Write names of any *two* vestigial organs in the human body.

Ans. Names of vestigial organs in human body : Appendix, tail-bone or coccyx, wisdom teeth, body hair, muscles of ear pinna.

(C) Write name of those animals in which these vestigial organs are functional.

Ans. Appendix is vestigial for humans, but it is functional in ruminant animals. Muscles of ear pinna are vestigial for humans but in monkeys and cattle they are functional.

(viii) Read the statements and answer accordingly :

(A) Calcareous spines are present on the body. Tube feet are used for locomotion and capturing prey also.

— Identify the phylum and give *one* example.

Ans. Phylum – Echinodermata

Examples – Sea urchin, starfish, brittle star, sea cucumber, etc.

(B) I live in your small intestine. Pseudocoelom is present in my thread like body.

— Identify the phylum and give *one* example.

Ans. Phylum – Aschelminthes

Examples – *Ascaris* (intestinal worm), Filarial worm, *Loa loa* (eye worm).

(C) My body is spindle-shaped. I respire with the help of gills. — Identify my class and give *one* example.

Ans. Class – Pisces

Examples – Rohu, Pomfret, Sea horse, Shark, Electric ray, Sting ray, etc.

Q. 4. Answer any *one* :

(i) Answer the following questions based on human male reproductive system :

(A) In which organ sperms are formed?

Ans. Sperms are formed in the testes.

(B) What is the length of a sperm?

Ans. The length of a sperm is about 60 micrometres.

(C) What is the work of vas deferens?

Ans. Vas deferens helps the forward movement of sperms.

(D) By which type of cell division, sperms are formed?

Ans. Sperms are formed by meiosis.

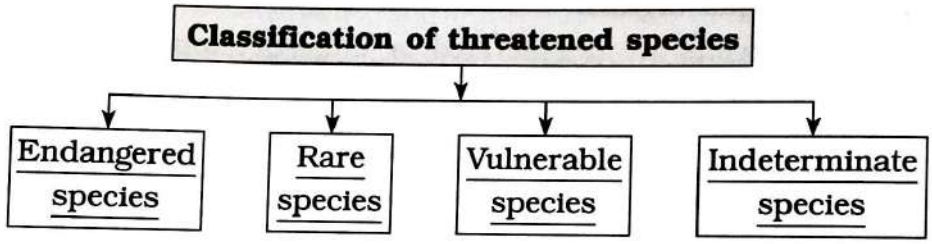
(E) Name any *two* unpaired organs of male reproductive system.

Ans. Unpaired organs of male reproductive system are Urinogenital duct, Penis, Scrotum, Prostate gland.

(ii) Answer the following questions based on environmental conservation and biodiversity :

(A) Complete the flow chart :

Ans. *(Answers are underlined)*



(B) How can biodiversity be conserved? Give any *four* points.

Ans. Biodiversity can be conserved by the following ways :

Protection of the rare species of plants and animals.

(2) Establishing national parks and sanctuaries.

(3) Declaring some regions as 'bioreserves'.

(4) Projects for conservation of special species.

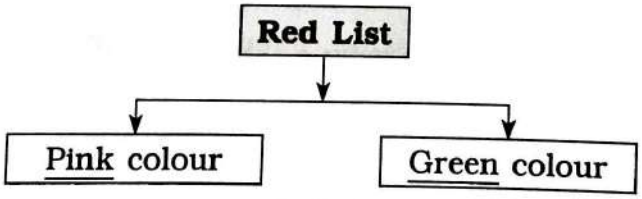
(5) Conserving all plants and animals.

(6) Strict observance of the acts and rules.

(7) Maintaining record of traditional knowledge.

(C) Complete the flow chart :

Ans. Colour of the pages in Red List of Endangered Species.



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