

SCIENCE & TECHNOLOGY (PART 2)
BOARD'S ACTIVITY SHEET (MARCH 2020)**(With Full Solution)****Time : 2 Hours]****[Total Marks : 40****Note :** (i) All questions are compulsory.

(ii) Start every main question on a new page.

(iii) The numbers to the right of the questions indicate full marks.

(iv) In case of MCQs (Q. No. 1(A)) only the first attempt will be evaluated and will be given credit.

(v) For each MCQ, the correct alternative (A), (B), (C) or (D) with subquestion number is to be written as an answer.

For Eg. : (i) (A), (ii) (B), (iii) (C)

(vi) Scientifically correct, labelled diagrams should be drawn wherever necessary.

Q. 1. (A) Choose the correct option and write its number for the following questions :**5**

(i) Transfer of information from molecule of DNA to mRNA is called process.

(A) Transcription

(B) Translation

(C) Translocation

(D) Mutation

(ii) Body breaks up into several fragments and each fragment starts to live as a new individual. This is type of reproduction.

(A) Budding

(B) Fragmentation

(C) Regeneration

(D) Binary fission

(iii) Incomplete combustion of fuels leads to formation of

(A) Carbon monoxide

(B) Carbon dioxide

(C) Chlorofluorocarbon

(D) Hydrogen sulphide

(iv) The spindle fibres start appearing from stage of karyokinesis.

(A) Prophase

(B) Metaphase

(C) Anaphase

(D) Telophase

(v) Salts which can be used as supplement of calcium and iron are obtained from

(A) Carbonic acid

(B) Acetic acid

(C) Citric acid

(D) Gluconic acid

Q. 1. (B) Solve the following questions :

5

- (i) Find odd one out :
Drying, Salting, Cooking, Soaking with sugar.
- (ii) Write the correct correlation :
Annelida : Earthworm :: Platyhelminthes :
- (iii) State whether True/False :
Tobacco containing substances cannot cause cancer of mouth and lungs.
- (iv) Write function of testes.
- (v) I am connecting link between Reptilia and Mammals. What is my name?

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

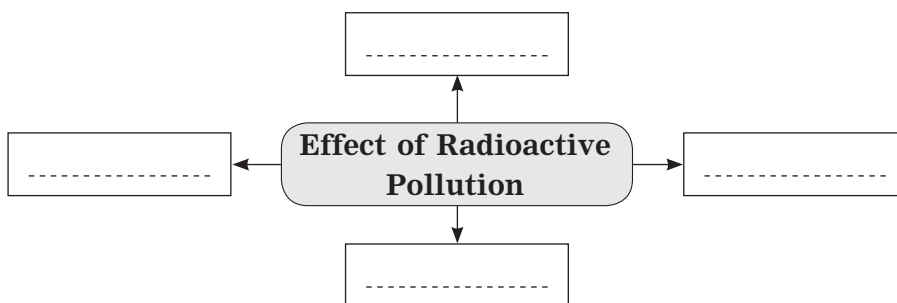
4

- (i) Indians should follow family planning for controlling the population.
- (ii) We feel exhausted after exercising.
- (iii) Hydroelectric energy, solar energy and wind energy are called renewable energies.

Q. 2. (B) Solve the following questions : (Any three)

6

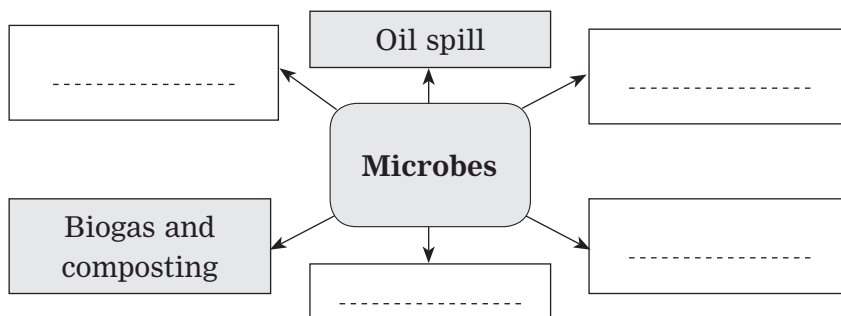
- (i) Complete the following chart :



- (ii) Distinguish between Aves and Mammalia.
- (iii) By observing given picture, write any two effects of this disaster :



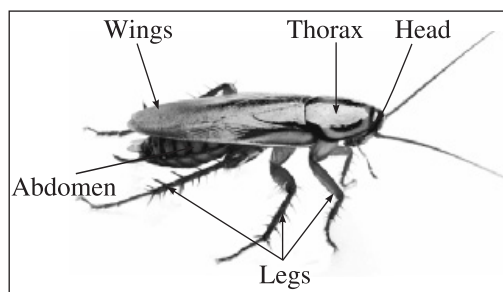
- (iv) Explain four ways to minimize stress.
- (v) Complete the following conceptual picture :



Q. 3. Solve the following questions : (Any five)

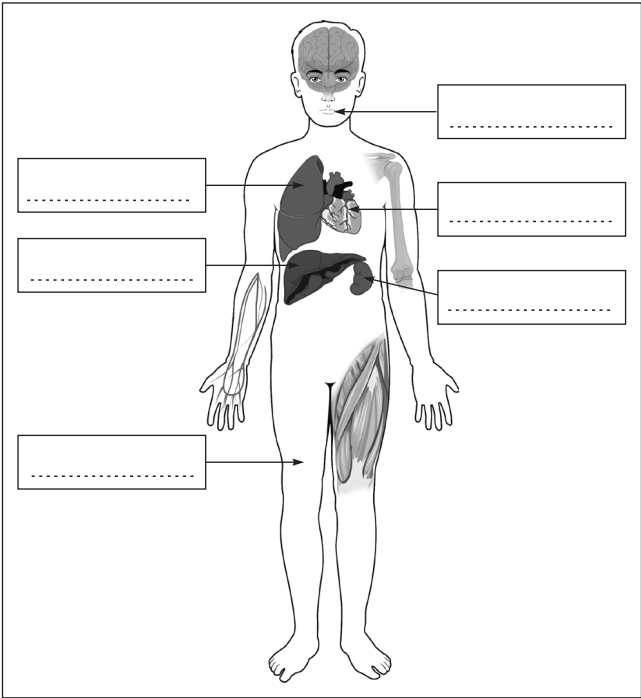
15

- (i) Explain the importance of Anatomical evidences with examples.
- (ii) What will you do? Why?
- (a) Child of your neighbour is addicted to tobacco chewing.
- (b) Your friend has developed the hobby of snapping selfies.
- (c) Your sister has become incommunicative. She prefers to remain alone.
- (iii) Which precautions are necessary for proper decomposition of domestic waste?
- (iv) Observe the following diagram. Write the answers of the following questions :



- (a) To which phylum does the animal included in the diagram belong?
- (b) What is the exoskeleton made up?
- (c) What is the symmetry?
- (v) Explain the following concepts in short :
- (a) Surrogacy
- (b) In Vitro Fertilization (IVF)
- (c) Sperm Bank.

(vi) Label the body organization of human which has been shown in the following figure :



(vii) Make a table based on forms of energy and corresponding devices :

Forms of Energy	Devices
(1) Electric
(2) Mechanical	Sewing machine, Bicycle
(3) Thermal
(4)	Solar cooker, Solar heater

(viii) Complete the paragraph using proper words :

(Mechanical, *Rhizobium*, Aquatic, Toxic, CO₂, Nitrogen, *Pseudomonas*, Amoeba, Bacteria, Hydrocarbons)

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

(i) Attempts at various levels are performed for conserving environment.

Which role would you like to perform. Give two actions each :

(a) Prevention

(b) Control

(c) Production

(d) Awareness

(e) Conservation

(ii) (a) What is Biotechnology?

(b) Give one use of Biotechnology.

(c) Give one commercial use of Biotechnology.

(d) Write two bacterial examples of biofertilizer.

(e) Write two names of crops genetically developed.

SOLUTION : BOARD'S ACTIVITY SHEET (MARCH 2020)

Q. 1. (A)

- (i) (A)
- (ii) (B)
- (iii) (A)
- (iv) (B)
- (v) (D)

Q. 1. (B)

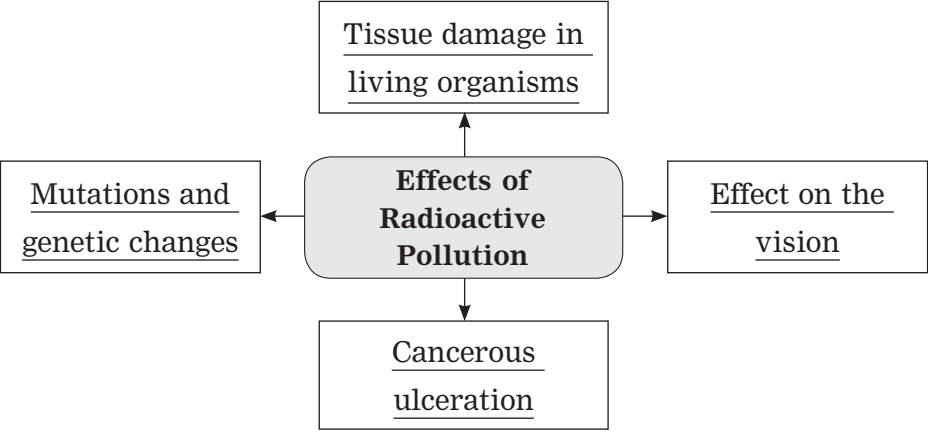
- (i) Cooking
- (ii) Annelida : Earthworm : : Platyhelminthes : Planarial/Liverfluke
- (iii) False
- (iv) Function of testes : Production of sperms and male hormone testosterone
- (v) Duck Billed platypus

Q. 2. (A)

- (i) (1) There is severe population explosion in India. It has almost reached 121 crores.
(2) This results in unemployment, decreasing per capita income and increasing loan, stress on natural resources, etc.
(3) Only by controlling population, the quality of life can be restored.
(4) Therefore, Indians should follow family planning for controlling the Indian population.
- (ii) (1) When we undertake constant exercises, there may be shortage of oxygen for the cells.
(2) Therefore, our muscles and other tissues perform anaerobic respiration in such condition.
(3) In this process, lactic acid is formed. 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 about a feeling of exhaustion.
- (iii) (1) Hydroelectric energy, solar energy and wind energy is 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. They will not be finished.
(3) On the contrary, the conventional energy sources such as coal and fossil fuels have limited reserves.
(4) They cannot be renewed and may get exhausted in future. Hydroelectric energy, solar energy and wind energy can be replenished and hence they are called renewable.

Q. 2. (B)

(i)



(ii)

Aves	Mammalia
<div>1. Aves are totally adapted for the aerial mode of life.</div> <div>2. Body is spindle shaped. Body is divisible into head, neck and trunk. There are two pairs of limbs. The forelimbs are modified to form wings for flight.</div> <div>3. Digits have scales and claws.</div> <div>4. The exoskeleton is in the form of feathers.</div> <div>5. Jaws are modified into a beak.</div> <div>6. Birds are oviparous. The eggs hatch into nestlings.</div> <div>7. The incubation of eggs and feeding of nestlings is done by both parents.</div> <div>Examples : Crow, Sparrow, Peacock, Parrot, Pigeon, Duck, Penguin, etc.</div>	<div>1. Mammals are adapted for terrestrial life.</div> <div>2. Body is not spindle shaped. It is divisible into head, neck, trunk and tail. There are two pairs of limbs. They are adapted for walking or running on the ground.</div> <div>3. Digits have nails or hoofs. Few have claws.</div> <div>4. The exoskeleton is in the form of fur, hair, wool, etc.</div> <div>5. Jaws have teeth and they surround the mouth.</div> <div>6. Mammals are viviparous. They give birth to live young ones. (Exception : Platypus)</div> <div>7. Parental care is shown only by mother, who feeds the babies with milk from mammary glands.</div> <div>Examples : Cat, Dog, Tiger, Lion, Elephant, Human, Kangaroo, Dolphin, Bat, etc.</div>

(Note : Students should write required points according to marks allotted for question.)

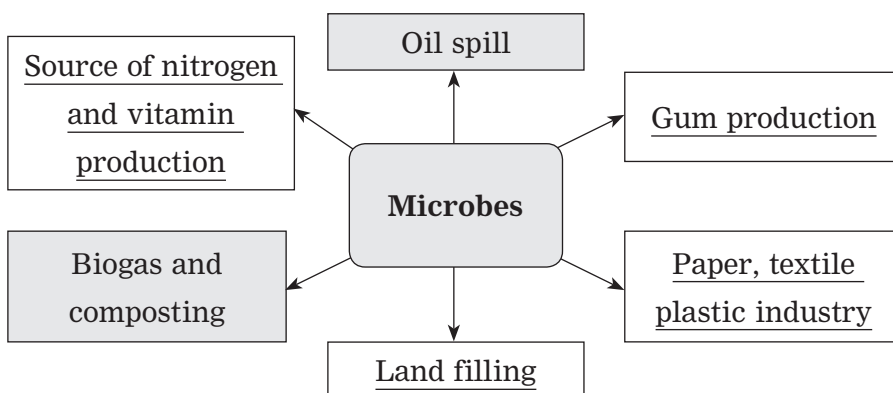
(iii) Effects of the disaster of railway accident :

- (1) The passengers commuting the train die or suffer from serious injuries.
- (2) Due to railway accident, railway traffic is disrupted and railways suffer huge financial loss.

(iv) The ways of minimizing stress are as follows :

- (1) **Laughter club** : People gather together and laugh collectively to reduce stress.
- (2) **Good communication** : One should establish good communication with friends, siblings, cousins, teachers, parents or anybody in whom we can confide and express our feelings.
- (3) **Writing** : By writing and noting the thoughts we feel relieved. We can confess and analyse our mistakes through writing to reduce our stress.
- (4) **Hobbies** : Collecting curios, photography, reading good literature, music, cooking, gardening, bird watching, keeping a pet, sculpturing, drawing, rangoli, dancing, etc. are such hobbies which are necessary for utilizing our spare time by creativity. Persuading hobby is the best way to be stress-free. Music in particular is said to change the negative thoughts, therefore, listening to music, learning the music and singing helps to fight stress. By admiring nature too, stress is relieved.

(v)



Q. 3.

- (i) (1) There are similarities in the structure and anatomy of different animal groups. E.g. human hand, forelimb of bull, patagium of bat and flipper of whale are all similar in their internal anatomy. There is similarity in the bones and joints of all these specimens.
- (2) External morphology does not show any similarity. Use of each of the organ is also different in different animals. Structurally, they may not be related.
- (3) However, the similarities in the anatomy is an evidence that they may have a common ancestor.
- (4) In this way, the anatomical evidence throws light on the process of evolution.

- (ii) (a) The hazards of tobacco chewing will be explained to this child. Different photographs and videos showing the conditions of oral cancer will be shown to this child to persuade him, so that he can stay away from tobacco. This addiction has to be removed, so help of his parents will be taken. They will be told about the child's habit and asked to help him free from his addiction.
- (b) The habit of continuously taking selfie is bad. It shows that the friend is constantly thinking of himself only. His self-centredness is to be removed by counselling him. The reason behind this behaviour should also be understood. He should be diverted and motivated to take some other task so that his habit can be lessened. Taking selfies is not a hobby. It is a bad habit if someone is repeatedly engaged in it.
- (c) The individual who prefers to be incommunicative has lots of thoughts in his/her mind.

If this is the case with sister, she will be taken into confidence and the reason behind this lack of communication will be found out. Most often such persons have depression. So she will not be left alone. Her friends will be invited at home, so that she can converse with them. She should be motivated to mix with her favourite people. She should be encouraged to pursue her hobbies. She should be helped in selecting such work, If nothing changes her, then the help of counsellor should be taken.

- (iii) (1) The domestic waste should be properly segregated into biodegradable (wet waste) and non-biodegradable (dry waste).
- (2) After segregation, these wastes should be stored separately into two different containers.
- (3) The non-biodegradable substances should be either reused or sent for recycling. The biodegradable substances are decomposed naturally.
- (4) The decomposition process can be done at household level too in a pot or a tank. This decomposition will yield a rich manure. The pot should be covered by a thin layer of soil and it should be kept in a dark but airy place.
- (5) The non-biodegradable things such as plastic articles, glass pieces, metal objects, unused medicines, e-waste should never be thrown in wet wastes.
- (6) The toxic substances and the insecticides if added to wet waste, will never allow the natural decomposition process. Therefore, only after taking adequate precautions we can aim at proper decomposition of domestic wastes.
- (iv) (a) This animal is included in phylum Arthropoda
- (b) The exoskeleton is made up of chitinous substance.
- (c) Symmetry : Bilateral

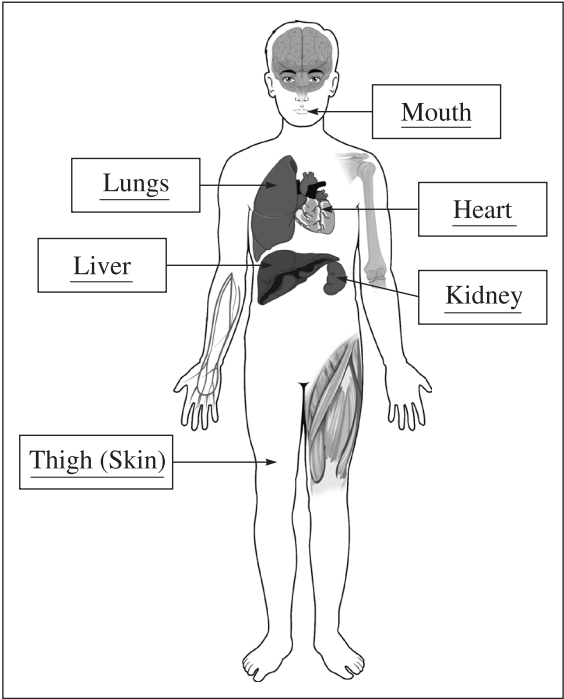
(v) (a) **Surrogacy** : In woman if there is problem regarding the implantation of embryo in uterus, then help of another women is taken. This woman is called surrogate mother.

Oocyte from real mother is taken out and fertilized with sperms collected from her husband. These gametes are fertilized outside in a test-tube and then the fertilized zygote is implanted in the surrogate mother.

(b) In Vitro Fertilization (IVF) is done when there are problems like less sperm count or obstacles in oviduct. In IVF, fertilization is done in the test-tube. The embryo formed is implanted in uterus of woman for further growth.

(c) **Sperm bank** : If man has problems with the sperm production, then the sperms are collected from the sperm bank. Sperm bank is the place where the donors donate the sperms and such sperms are kept stored. The donor's identity is kept secret and he should also be a physically and medically fit person.

(vi)



(vii)	Forms of energy	Devices
	(1) Electric	<u>Electric iron, Heater</u>
	(2) Mechanical	Sewing machine, Bicycle
	(3) Thermal	<u>Furnace, Steam engine</u>
	(4) <u>Solar</u>	Solar cooker, Solar heater

(viii) 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 hydrocarbonoclastic bacteria (HCB), HCB decompose the hydrocarbons and bring about the reaction of carbon with oxygen. CO₂ and water is formed in this process.

Q. 4.

(i) I like the role of ‘control for environmental conservation.’ By control we can change the attitude of population. We can carry out significant project to explain about harmful effects of plastic.

(a) Prevention :

- (1) I will not allow anybody to cut down the trees.
- (2) I will take care of birds and animals.

(b) Control :

- (1) I will control the use of water.
- (2) I will control the excessive use of plastic.

(c) Production :

- (1) I will help in creating gardens.
- (2) I will help in growing medicinal plants.

(d) Awareness :

- (1) I will work for important issues such as climate change by carrying out awareness campaigns.
- (2) I shall establish nature club and will invite my classmates to take part in the activities.

(e) Conservation :

- (1) I will not waste food, clothing.
- (2) I will help in foresting.

[This is an open ended question. Students can express their own view or role for environmental conservation.]

(ii) (a) Biotechnology : Technology that brings about artificial genetic changes and hybridization in organisms for human welfare is called biotechnology.

(b) Biotechnology is very useful in improving the yield and variety of agricultural products.

(c) Commercial use of biotechnology : Production of hormones, interferons, antibiotics and different vaccines.

(d) Rhizobium and Azotobacter are used to prepare natural fertilizers.

(e) Genetically modified crops : Golden Rice and Bt. Cotton.

SCIENCE & TECHNOLOGY (PART 2)
BOARD'S ACTIVITY SHEET (NOVEMBER 2020)

(With Full Solution)

Time : 2 Hours]

[Total Marks : 40

Note : (i) All questions are compulsory.

(ii) Start every main question on a new page.

(iii) The numbers to the right of the questions indicate full marks.

(iv) In case of MCQs (Q. No. 1(A)) only the first attempt will be evaluated and will be given credit.

(v) For each MCQ, the correct alternative (A), (B), (C) or (D) with subquestion number is to be written as an answer.

For Eg. : (i) (A), (ii) (B), (iii) (C)

(vi) Scientifically correct, labelled diagrams should be drawn wherever necessary.

Q. 1. (A) Choose the correct alternative from the given options :

5

(i) Water reservoir possesses energy.

(A) Nuclear (B) Thermal (C) Kinetic (D) Potential

(ii) In mitotic division, nuclear membrane completely disappears in phase.

(A) Telophase (B) Prophase (C) Metaphase (D) Anaphase

(iii) Genetic changes occur due to pollution.

(A) Radioactive (B) Air (C) Water (D) Soil

(iv) In human, sperm production occurs in the organ.

(A) Seminal vesicle (B) Testes

(C) Prostate gland (D) Cowper's gland

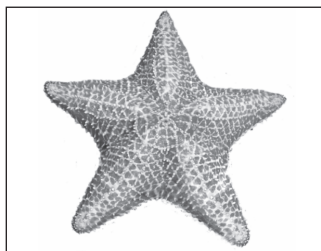
(v) Which sanctuary of Assam is underthreat due to dams and indiscriminate use of water?

(A) Tadoba (B) Kaziranga (C) Manas (D) Sundarban

Q. 1. (B) Answer the following subquestions as per given instruction :

5

(i)



Name the locomotory organ of animal shown in the above figure.

(ii) Find the correct correlation :

Spirogyra : Fragmentation : : Planaria :

(iii) Write whether the following statement is True *or* False :

DNA fingerprinting is mainly useful in Forensic Sciences..

(iv) Write the molecular formula :

4% acetic acid (Vinegar).

(v) Which molecules are necessary for the formation of plasma membrane?

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

4

(i) While performing the exercise, we feel tired.

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

(iii) Microbial enzymes are used instead of chemical catalysts in chemical industry.

Q. 2. (B) Answer the following questions : (Any three)

6

(i) Distinguish between Aerobic respiration and Anaerobic respiration.

(Any two points)

(ii) Write a short note on Sacred groves,

(iii) Explain the term :

Modern technology of reproduction IVF.

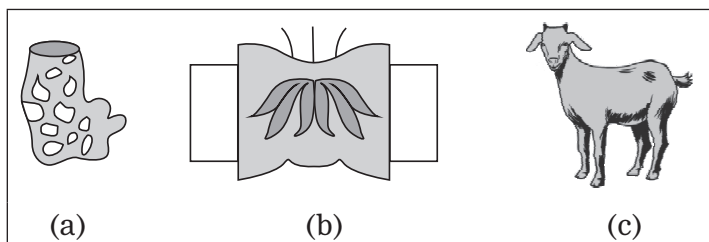
(iv) How is *Balanoglossus* connecting link between chordates and non-chordates?

(v) Explain Darwin's theory of natural selection.

Q. 3. Answer any five questions from the following :

15

(i)



Identify and explain the above different types of symmetry.

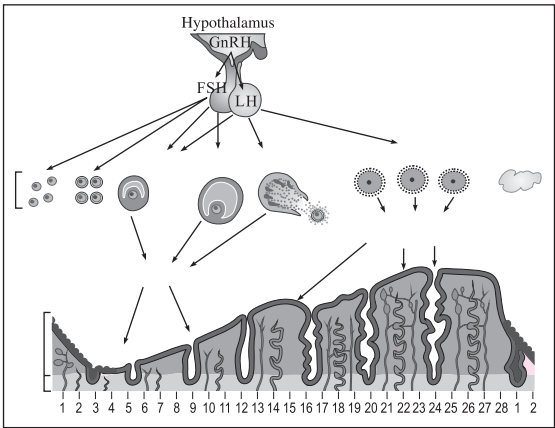
(ii) Write any six factors affecting the social health.

(iii) Complete the following chart :

Substance obtained by microbial processing	Roles
(a) Citric acid	-----
(b) Ascorbic acid	-----
(c) Beta carotene	-----
(d) Glycolipids	-----
(e) Vanillin	-----
(f) Xylitol	-----

(iv) Explain the three different levels of Biodiversity.

(v) Observe the following figure and answer the questions :



(a) Identify the process in above figure and after how many days it will repeat again?

(b) Write the names of hormones involved in this process.

(vi) What are the advantages of hydroelectric power generation?

(vii) (a) Define vestigial organs.

(b) Write name of any two vestigial organs in human body.

(c) Explain how one human vestigial organ is functional in another animal.

(viii) What will you do in the following cases and why?

(a) Child of your neighbour is addicted to tobacco chewing.

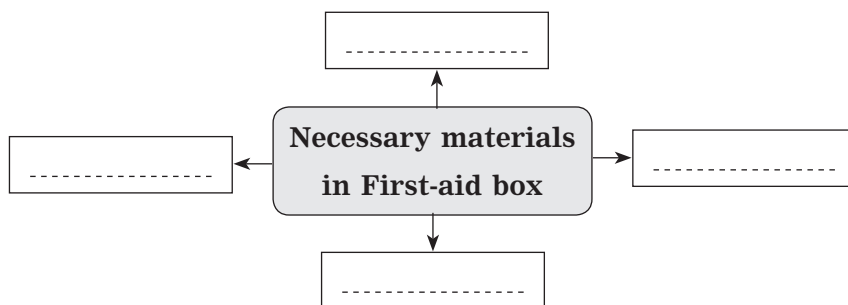
(b) You have to use free space around your home for good purpose.

(c) Your friend has developed the hobby of snapping selfies.

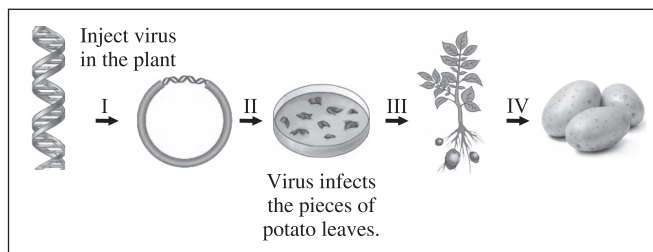
Q. 4. Solve the following questions : (Any one)

5

- (i) (a) What is meant by disaster management? (1)
- (b) Classify the following activities into pre-disaster management and post-disaster management : (2)
- (1) Identifying the pro-disaster areas.
 - (2) Quick establishment of help centre.
 - (3) Participation of preferably local peoples saved from the disaster in arranging the help to victims.
 - (4) Getting special training for disaster management. (2)
- (c) Complete the diagram :



- (ii) Observe the figure and answer the following questions :



- (a) Identify the process given in the above figure. (1)
- (b) Write the importance of above process. (2)
- (c) Write any two benefits of Biotechnology. (2)

SOLUTION : BOARD'S ACTIVITY SHEET (NOVEMBER 2020)

Q. 1. (A)

- (i) (D)
- (ii) (C)
- (iii) (A)
- (iv) (B)
- (v) (C)

Q. 1. (B)

- (i) The name of locomotory organ of animal shown in the given figure is Tubefeet.
- (ii) Spirogyra : Fragmentation : : Planaria : Regeneration.
- (iii) True
- (iv) CH_3COOH
- (v) Phospholipids molecules are necessary for the formation of plasma membrane.

Q. 2. (A)

- (i) (1) When we undertake constant exercises, there may be shortage of oxygen for the cells.
(2) Therefore, our muscles and other tissues perform anaerobic respiration in such condition.
(3) In this process, lactic acid is formed.
(4) Molecules of ATP produced in oxidation of food are also much less.
(5) Thus, there is less energy in the body and accumulation of lactic acid too. All this brings about a feeling of exhaustion.
- (ii) (1) Hydroelectric energy, solar energy and wind energy is 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. They will not be finished.
(3) On the contrary, the conventional energy sources such as coal and fossil fuels have limited reserves.
(4) They cannot be renewed and may get exhausted in future. Hydroelectric energy, solar energy and wind energy can be replenished and hence they are called renewable.
- (iii) (1) Microbial enzymes are active at low temperature, pH and pressure.
(2) Due to this property, the energy is saved. The costlier erosion-proof instruments need not be used.
(3) In enzymatic reactions, the unnecessary byproducts are not formed as the reactions are highly specific.

- (4) The expenses on purification of the product are minimized as no unnecessary products are formed.
- (5) The elimination and decomposition of waste material is avoided and enzymes can be reused again. Hence, microbial enzymes which are eco-friendly are used in chemical industry.

Q. 2. (B)

(i)

Aerobic respiration	Anaerobic respiration
1. Oxygen is required for aerobic respiration.	1. Oxygen is not required for anaerobic respiration.
2. Aerobic respiration takes place in nucleus as well as in cytoplasm.	2. Anaerobic respiration occurs only in the cytoplasm.
3. At the end of aerobic respiration CO_2 and H_2O is formed.	3. At the end of anaerobic respiration CO_2 and $\text{C}_2\text{H}_5\text{OH}$ are formed.
4. Energy is produced in large amount in aerobic respiration.	4. Energy is produced in lesser amount in anaerobic respiration.
5. Glucose is completely oxidized in aerobic respiration.	5. Glucose is incompletely oxidized in anaerobic respiration.
6. 38 molecules of ATP are formed during aerobic respiration.	6. 2 molecules of ATP are formed during anaerobic respiration.
7. Chemical reaction : $\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{H}_2\text{O} + 6\text{CO}_2 + 686 \text{ Kcal}$	7. Chemical reaction : $\text{C}_6\text{H}_{12}\text{O}_6 \rightarrow 2 \text{C}_2\text{H}_5\text{OH} + 2\text{CO}_2 + 50 \text{ Kcal}$

(Note : *Students should write the required points according to marks allotted for question.***)**

(ii) Sacred grove is the green patch of the forest which is conserved by local people in the name of God. It does not belong to forest department. It is like a sanctuary that is conserved by the common people and tribals in the area. It is rich in the biodiversity. It is conserved as there is a faith that God or deity reside in the sacred grove. Hence in local language, they are known as Deorai. Due to this reason, people do not fell the trees. Also hunting of any wild life is not done here. More than 13,000 sacred groves have been reported in India. Most of these are in Western Ghats in Maharashtra, Karnataka and Kerala. Also, in remaining parts of India sacred groves are reported. Role of sacred grove is tremendous in conserving the biodiversity.

(iii) (1) IVF means In Vitro Fertilization (IVF).

(2) This is the technique in the modern medical field where childless couples can be blessed by their own child.

- (3) IVF technique is used for childless couples who are faced with problems such as less sperm count, obstacles in oviduct, etc.
 - (4) The IVF technique is done by removing the oocyte from the mother and artificially fertilizing by the sperms collected from father. This fertilization is done in a test-tube. Thus it is also called test tube baby. The embryo formed is implanted in uterus of real mother or a surrogate mother at appropriate time.
- (iv) (1) *Balanoglossus* shows some characters of non-chordates.
- (2) It also has notochord as in case of chordates.
 - (3) Since it shares the characters of non-chordates and chordates, from the view point of evolution, it is called connecting link between them.
- (v) (1) Charles Darwin proposed the theory of natural selection after making many observations on different specimens. He published a concept 'Survival of the fittest'.
- (2) Darwin explains this concept as follows: All the organisms reproduce prolifically. Therefore, there is always a competition for food, mate, etc. Only those organisms survive which show the adaptations for sustaining this struggle.
 - (3) Natural selection plays important role by selecting only those organisms which are fit to live. Those that do not have better adaptations, perish. Selected sustaining organisms then perform reproduction and form new species in a very long period of time.
 - (4) Darwin published his views in the book titled 'Origin of Species'.

Q. 3.

- (i) (a) **Asymmetrical body** : In asymmetrical body, there is no imaginary axis that can pass through body and divide it into two equal halves, e.g. Amoeba.
 - (b) **Radial symmetry** : In this type of body, if imaginary cut passes through central axis, in any plane of body, then it can give two equal halves.
 - (c) **Bilateral symmetry** : In such type of symmetry, there is only one imaginary axis that can pass through the body dividing it into two equal halves.
- (ii) (1) In order to maintain the social health of any community there should be good amenities for the people. E.g. food, water, shelter, clothing, medicines and medical help, equal opportunities for education, cleanliness of the surroundings, transport facilities etc. should be properly provided.
- (2) The social and political conditions of the surrounding should be such that there should not be any connections with world of criminals. The presence of such criminal ties can affect the social health to a great extent.

- (3) The gardens, playgrounds, the empty plots for outdoor games, sports clubs, etc. are important criteria for overall development of the society. This results into personality development and make people happy and strong.
- (4) Addictions, criminal tendencies, pervert behaviour and perverse thinking affects other people in the society and this reflects negatively on the social health.
- (5) Having large number of friends and relatives, proper use of time when alone and when along the peer group, trust in others, respect and acceptance for others build stronger social health.
- (6) The habit of having trust on other people, to give respect other people and accepting them humbly, these are some important factors which affects the social health.

(iii)

Substance obtained by microbial processing	Roles
(a) Citric acid	<u>To impart acidity</u>
(b) Ascorbic acid	<u>Antioxidants, vitamins</u>
(c) Beta carotene	<u>Edible colours</u>
(d) Glycolipid	<u>Emulsifiers</u>
(e) Vanillin	<u>Essence</u>
(f) Xylitol	<u>Artificial sweetener (low caloric)</u>

(iv) Biodiversity is documented on the following three levels, viz. genetic diversity, species diversity and ecosystem diversity.

- (1) **Genetic Diversity** : Diversity seen among the organisms of same species due to genetic differences is called genetic diversity. E.g. The individual human beings are different from each other. No two animals or plants are exactly alike.
- (2) **Species Diversity** : The difference between the different species is the species diversity. e.g. All the species of plants, animals and microbes which are seen in any natural environment.
- (3) **Ecosystem Diversity** : In one region there may be different ecosystems, such diversity in the ecosystems is called ecosystem diversity. Ecosystems are natural or artificial. Every region shows different types of ecosystems such as aquatic, terrestrial, desert or forest ecosystems. Each ecosystem has its own habitats with resident flora and fauna.

- (v) (a) The figure indicates the menstrual cycle in human female, the menstrual cycle shows repetitive changes every 28 to 30 days.

(b) Following hormones regulate this menstrual cycle.

Pituitary hormones : Follicle Stimulating Hormone (FSH) and Luteinizing Hormones (LH)

Ovarian hormones : Estrogen and progesterone

(vi) (1) Hydroelectric energy does not cause pollution.

(2) Generation of hydroelectric energy does not involve burning of fossil fuel.

(3) If sufficient water storage is available then electricity generation can be done as per requirement.

(4) Rainwater can replenish the water storage and power generation can thus be done uninterrupted.

(vii) (a) Vestigial organs are degenerated or underdeveloped organs of organisms which do not perform any function.

According to the principle of natural selection, such organs are on the verge of disappearance. But it takes many millions of years for its complete vanishing.

(b) Names of vestigial organs in human body : Appendix, tail-bone or coccyx, wisdom teeth and body hair.

(c) (1) Appendix is vestigial for humans, it does not perform any function but in ruminant animals it is concerned with digestion.

(2) Ear muscles are vestigial for us but in monkeys and cattle they are functional.

(3) The vestigial organs in one animal may be of use but to other kind of the animal as they still perform regular functions.

(viii) (a) The hazards of tobacco chewing will be explained to this child. Different photographs and videos showing the conditions of oral cancer will be shown to this child to persuade him, so that he can stay away from tobacco. This addiction has to be removed, so help of his parents will be taken. They will be told about the child's habit and asked to help him free from his addiction.

(b) The free space around our home can be used to make a small garden. The garden-soil can be bought and spread in this free space. Small saplings can be planted here and nurtured for further growth. Nursery of saplings can also be started in this free space.

The space can also be used for outdoor games. The net for Badminton can be fixed and evening times can be spent in playing the game. Also care will be taken to keep the space clean and without any garbage.

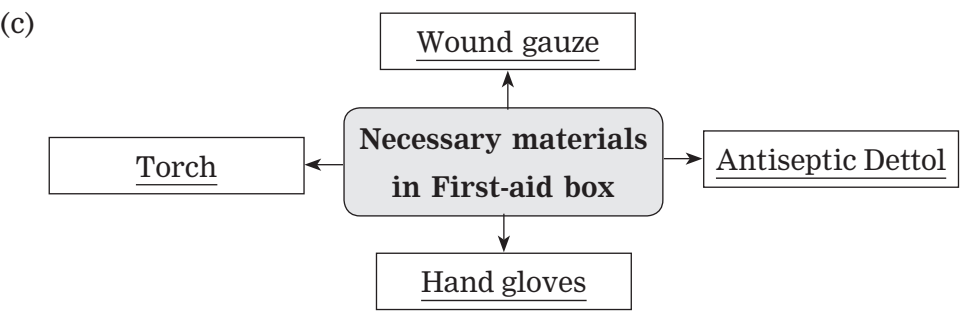
- (c) The habit of continuously taking selfie is bad. It shows that the friend is constantly thinking of himself only. His self-centredness is to be removed by counselling him. The reason behind this behaviour should also be understood. He should be diverted and motivated to take some other tasks so that his habit can be lessened. Taking selfies is not a hobby. It is a bad habit if someone is repeatedly engaged in it.

Q. 4.

- (i) (a) Disaster management is either prevention of disasters or making arrangements to face it or at least achieve the abilities to face it.

(b)

Predisaster Management	Postdisaster Management
(1) Identifying the pro-disaster areas. (2) Getting special training for disaster management	(1) Quick establishment of help centre. (2) Participation of preferably local people saved from the disaster in arranging the help to victims.



- (ii) (a) The process of making transgenic potatoes is shown in the figure.
- (b) (1) These potatoes act against bacteria causing cholera e.g. vibrio cholerae. Alsoo they are effective against *Escherichia coli*.
- (2) Consumption of raw potatoes produces immunity against cholera and colitis – disease caused by *Escherichia coli*.
- (c) (1) Per hectare yield is increased though there are limitation in crop agriculture.
- (2) Expenses of disease control are minimized due to development of resistant varieties.

* * *