

Board Activity Sheet Solution: March 2020

Science and Technology Part – 2

Q.1 (A)	i. (A) [1 Mark] ii. (B) [1 Mark] iii. (A) [1 Mark] iv. (B) [1 Mark] v. (D) [1 Mark]												
Q.1 (B)	i. Cooking [1 Mark] ii. Annelida: Earthworm :: Platyhelminthes: <u>Planaria</u> /Liver fluke /Tape worm [1 Mark] iii. False [1 Mark] iv. Testes produce sperms and secrete the hormone testosterone. [1 Mark] v. Duck-billed platypus [1 Mark]												
Q.2 (A)	i. a. Family planning is the practice of controlling the number of children one has and the intervals between their births. b. India is currently facing the problem of population explosion. c. 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. [2 Marks]												
	ii. a. While exercising the muscle cells perform anaerobic respiration. b. During anaerobic respiration in muscle cells, lactic acid accumulates in the body. c. Lactic acid accumulation is a result of the process of fermentation during which glucose is broken down by anaerobic respiration, forming organic acids. d. Also, the production of ATP is comparatively less during anaerobic respiration. Hence, we feel exhausted after exercising. [2 Marks]												
	iii. a. The sources of energy which are being produced continuously in nature and are inexhaustible, i.e., they are always available for use are called renewable sources of energy. b. Hydroelectric energy, solar energy, wind energy are produced from energy sources like water, sunlight and wind respectively that are produced continuously in nature and will not get depleted. Thus, hydroelectric energy, solar energy and wind energy are called renewable energies. [2 Marks]												
Q.2 (B)	i. <div style="text-align: center; margin-bottom: 10px;"> <pre> graph TD A["Cancerous ulceration due to exposure to high radiations of X-rays"] --> B["Effect of Radioactive Pollution"] B --> C["Changes in genetic constitution"] B --> D["Destruction of tissues of the body"] C --> E["Adverse effects on vision"] D --> E </pre> </div> <i>[1/2 mark for each correct point; 2 Marks]</i>												
	ii. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Aves</th> <th style="text-align: center;">Mammalia</th> </tr> </thead> <tbody> <tr> <td>a.</td> <td>Mammary glands are absent.</td> <td>Mammary glands are present.</td> </tr> <tr> <td>b.</td> <td>They are completely adapted for aerial life.</td> <td>They are mostly terrestrial animals with some exceptions like dolphin, bat, etc.</td> </tr> <tr> <td>c.</td> <td>Body is divided into head, neck and trunk.</td> <td>Body is divided into head, neck, trunk and tail.</td> </tr> </tbody> </table>		Aves	Mammalia	a.	Mammary glands are absent.	Mammary glands are present.	b.	They are completely adapted for aerial life.	They are mostly terrestrial animals with some exceptions like dolphin, bat, etc.	c.	Body is divided into head, neck and trunk.	Body is divided into head, neck, trunk and tail.
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d.	Exoskeleton is present in the form of feathers.	Exoskeleton is present in the form of hairs or fur.
e.	Digits are covered with scales and bear claws.	Digits are provided with nails, claws or hooves.
	e.g. Peacock, penguin, parrot, pigeon, duck, etc.	e.g. Elephant, human, kangaroo, dolphin, bat, etc.

[Any four points] [1/2 mark each; 2 Marks]

- iii. The given picture depicts a railway accident. Following are the effects of railway accident:

- a. Injury to people b. Loss of life
- c. Damage of railways d. Economic loss

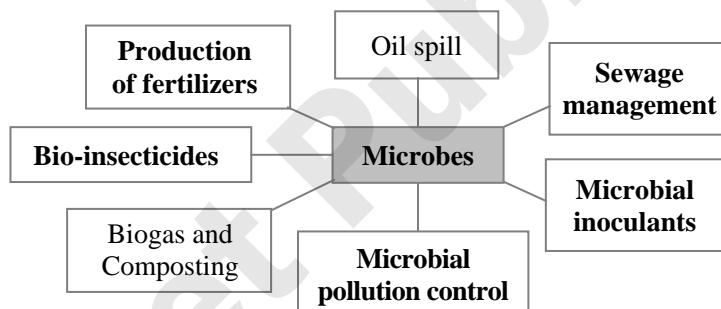
[Any two effects] [1 Mark each; 2 Marks]

- iv. Some of the ways to reduce stress are as follows:

- a. Maintaining good communication and expressing our feelings to friends, peers, cousins, teachers and parents or noting them down in a diary.
- b. Utilizing the free hours in fostering hobbies like material collection, photography, reading, cooking, sculpting, drawing, making rangoli, dancing, singing, listening to music, etc.
- c. Diverting energy and mind towards positive thinking, so as to neutralize the negative thoughts. Regular exercising, getting a massage, practicing yoga and meditation.
- d. Laughing loudly so as to relieve stress.
- e. Playing sports and outdoor games so as to involve physical exercise, inculcate discipline, increase interaction with others, drive away loneliness, etc.
- f. Inculcating traits like time management, planning of our own duties and taking own decisions.
- g. If any of the above methods fail to reduce stress and leads to more serious problems like depression and frustration, then medical help, counselling and/or psychotherapy should be taken.

[Any four points] [2 Marks]

- v.



[Any four points] [2 Marks]

Q.3

- i.
- a. Anatomical evidences are the similarities in structures and anatomy between different organisms.
 - b. The hand of human, foreleg of ox, flipper of whale and forelimbs of bat appear different superficially or morphologically.
 - c. Also, the function of these structures is different in different animals.
 - d. However, there is a similarity in the structure of bones and bony joints in the organs of these animals.
 - e. These similarities indicate that the animals evolved from a common ancestor thus providing proof of evolution.

[Any four points: 2 Marks, Examples: 1 Mark]

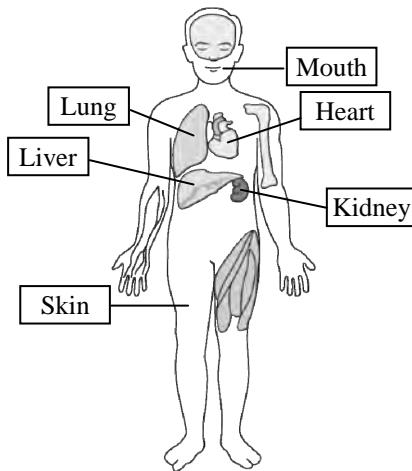
- ii.
- a. If I find that the child of my neighbour is addicted to tobacco chewing:
 - 1. I will make him aware about the health problems associated with chewing tobacco like mouth cancer, tooth decay, gum diseases, etc. This will help him to make decision about quitting tobacco.
 - 2. I will advise him to reduce the use of tobacco everyday till he finally quits it completely.
 - 3. I will also make him talk to his family or friends regarding the issue, so as to help him get rid of the habit.

[Any one point, 1 Mark]



- b. The bad habit of constantly taking selfies may endanger the life of a person as he is unaware of the risks in his surroundings.
If I find that my friend has developed the hobby of snapping selfies:
1. I will warn him to be careful while clicking selfies and to be aware about the surroundings so as to avoid accidents.
 2. I will try to persuade him to avoid clicking selfies at every occasion and to rather enjoy the moment with friends and / or family. **[Any one point, 1 Mark]**
- c. The feeling of staying alone or not communicating with others may lead to mental stress. This can eventually affect one's physical, mental and social health.
If I find that my sister has become incommunicative and prefers to remain alone;
1. I will talk to her and try to find out the reason for her aloofness and the stress. I will discuss her problem and help her find a solution to her problem.
 2. I will try to get her to speak with family members and participate in family discussions, family functions, etc. I would also encourage her to pursue her hobbies. This can help her divert her mind from the issues that are troubling her.
 3. If required I will advise her to consult a professional counsellor and discuss her problems. **[Any one point, 1 Mark]**
- iii. a. To ensure proper decomposition of waste, only biodegradable wastes like food waste, paper, etc. should be used.
- b. Non-biodegradable waste like plastic, thermocol, etc., should be separated, since it may contain hazardous chemicals that can kill the useful microbes and hamper the process of decomposition.
- c. Optimum moisture content should be maintained in the garbage pile in order to ensure faster decomposition of waste.
- d. Aeration by mixing should be performed to provide sufficient oxygen for aerobic microbes in the garbage pile and prevent generation of foul odours.
- e. The proportion of wet (green) waste to dry (brown) waste should be maintained in the compost pile. **[3 Marks]**
- iv. a. The animal represented in the diagram belongs to phylum Arthropoda. **[1 Mark]**
- b. The exoskeleton of cockroach is made up of chitin. **[1 Mark]**
- c. Symmetry is the number of symmetrical parts the animal can be divided into. Cockroach shows bilateral symmetry. **[1 Mark]**
- v. Childless couples can have a child with the help of advance medical techniques like surrogacy, sperm bank and IVF.
- a. **Surrogacy**
1. Women having problems with implantation of the embryo in the uterus can have a child with the help of surrogacy technique.
 2. 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.
 3. Embryo formed from fertilization is implanted in another woman (surrogate mother), having a normal uterus. **[1 Mark]**
- b. **In vitro fertilization**
1. IVF is a technique in which fertilization is brought about in the test tube. Sperm is injected into the ovum using a micropipette.
 2. The embryo formed after fertilization is implanted in the uterus of a woman at the appropriate time.
 3. Childless couples, who have problems like less sperm count, obstacles in oviduct, etc., can use IVF technique for having a child. **[1 Mark]**
- c. **Sperm Bank**
1. In sperm banks, semen is collected from the sperm donors after their physical and medical checkup and stored.
 2. Semen sample from the sperm bank is used to fertilize the oocyte of the female partner of the concerned couple.
 3. 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. **[1 Mark]**

vi.



[3 Marks]

vii.

	Forms of Energy	Devices
a.	Electric	Electric Fan, Electric iron
b.	Mechanical	Sewing machine, Bicycle
c.	Thermal	Steam Engine, Steam turbine
d.	Solar	Solar cooker, Solar heater

[3 Marks]

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 *Alcanivorax 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 **hydrocarbons** and bring about the reaction of carbon with oxygen. **CO₂** and water is formed in this process.

[½ mark each; 3 Marks]

(Note: In 'Complete the paragraph', students are expected to rewrite the complete paragraph and underline the answers.)

Q.4

- i. I would like to play the role in spreading awareness about the conservation of environment. By spreading awareness we can change the mind set and approach of people towards environment.
- Prevention**
 - I will try to prevent possible harms to environment.
 - I will not use plastics to prevent pollution caused by it.
 - Control**
 - I will use water and other natural resources in only limited required quantity.
 - I will stop the harmful activities like throwing garbage on road or public places.
 - Production**
 - I will work for revival of environmental factors.
 - I will try to develop projects for conservation of special species.
 - Awareness**
I will spread awareness through education, guidance, participation in various activities.
 - Conservation**
 - I will help in conserving the available resources.
 - I will protect plants and animals in my locality.
- ii. a. The technique of bringing about improvements in living organisms by genetic modifications and hybridization, for the welfare of human beings is called 'Biotechnology'.

[1 Mark]



- b. Following are the uses of biotechnology in various fields:
1. **Agriculture:** This includes production of cash crops, improvement in varieties of cash crops, increase in abilities of plants to withstand environmental stresses, etc.
 2. **Medical science:** Early diagnosis of congenital diseases, organ transplantation, cancer research, production of artificial skin, cartilage, etc. in laboratories.
 3. **Pharmaceutics:** Development of drugs, vaccines, etc., for treatment of a variety of human and animal diseases.
 4. **Environmental science:** Environment protection which includes development of newer techniques for pollution control and sewage treatment.

[Any one use; 1 Mark]

- c. **The commercial or professional uses of biotechnology are as follows:**
1. Biotechnology is used in the field of agriculture in order to improve crop variety and yields by techniques such as genetic modification, hybridization, etc.
 2. Techniques such as artificial insemination and embryo transfer are useful in animal husbandry to improve quality and/or quantity of animal products like milk, wool, meat, etc.
 3. Biotechnology has applications for the welfare of human health in diagnosis and treatment of diseases using vaccines, interferons, antibiotics, etc. Also, gene therapy and therapeutic cloning have application in treating genetic disorders.
 4. Biotechnology is used for the manufacture of industrial products, environmental management, food processing, green revolution, white revolution and blue revolution.
 5. DNA fingerprinting techniques play an important role in forensic sciences and paternity testing.

[Any one commercial use, 1 Mark]

- d. **Bacteria used as biofertilizers:**

Rhizobium, Azotobacter, Nostoc, Anabaena

[1 Mark]

- e. **Genetically modified crops:**

Bt cotton, Bt brinjal and golden rice.

[1 Mark]