

Maharashtra State Board
Class X
Science and Technology Paper – II
Sample Paper 5 - Solution

1. (A)

(1)

Scientist	Contribution
(1) Dr M.S. Swaminathan	(b) Green Revolution
(2) Dr Verghese Kurien	(a) White Revolution

(2) *Hibiscus*

(3) Environmental protection is value education.

(4) The given symbol is of WWF (World Wildlife Fund). This international institute looks after the welfare of wildlife through different conservation projects.

(5) Radial symmetry of a body is when an imaginary plane passing through the central axis but any plane of the body divides the body into two equal halves.

(B)

(1) Cells are actively dividing when the roots are growing.
Root tips are sites of rapid growth, so the cells are dividing rapidly.

(2) Sheep milk
Kefir is a curd-like food product made from sheep milk.

(3) Echinodermata
Phylum Echinodermata includes organisms with a water vascular system and a radially symmetrical body organisation.

(4) 10
10 major thermal power stations are operational in Maharashtra.

(5) China
As per 2019 statistics, China is the most populated country in the world followed by India.

2.

(1) Hormones secreted by the ovaries in females:

- Oestrogen
- Progesterone

Hormone secreted by the testes in males:

- Testosterone

(2) Hydrocarbonoclastic bacteria such as *Pseudomonas* are used to clear the oil spillage from ocean water. These bacteria decompose hydrocarbons. They bring about the reaction of released carbon with oxygen to produce CO₂ and water.

(3)

- (a) The diagram shows electricity generated from natural gas.
 (b) The energy is generated from natural gas.

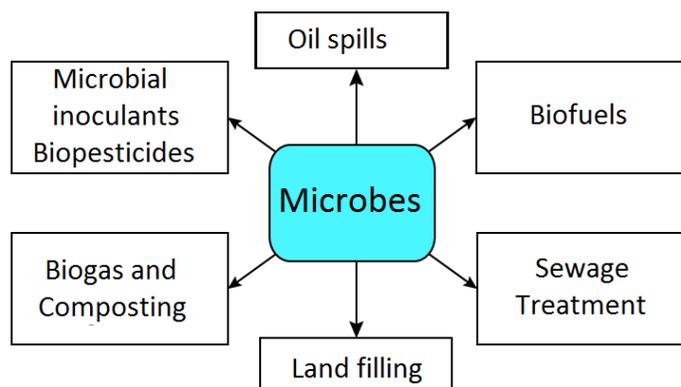
(4) Uses of biotechnology related to human health:

- To manufacture vaccines for the control of diseases
- To prepare different hormones such as insulin, somatotropin and somatostatin
- To manufacture clotting factors

(5) Famine

- Type of disaster:
Natural, climatic
- Effects of famine:
 - There is severe scarcity of water.
 - Fields and farms become barren.
 - There is shortage of food grains.
 - Local people have to migrate in search of food, water and shelter.

(6) Uses of microbes:



(7) **Activities which fall under the jurisdiction of Cyber Crime Law:**

(Any two)

- Bank transactions by procuring the PIN of someone.
- Misuse of written material of someone or illegal sale of the same.
- Hacking information of government institutes and companies.

3.

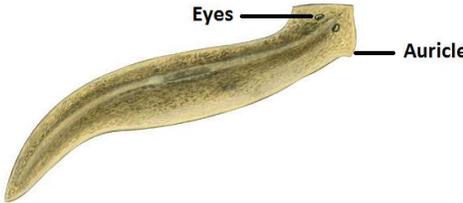
(1)

- Loose motions cause excessive loss of water from the body.
- This may result in dehydration and can prove lethal, if ignored.
- Especially, in case of young children, this situation can be extremely fatal.
- Oral Rehydration Solution (or ORS) is a mixture of moderate amounts of salts, sugar and water.
- Drinking ORS helps to maintain the fluid and salt levels in the body.
- Hence, in order to restore the normal proportion of water and electrolytes, ORS is given to people experiencing loose motions.

(2) **Differences between conventional and non-conventional sources of energy:**

Conventional sources of energy	Non-conventional sources of energy
1. They are available in the form of limited reserves.	1. They are available in abundance on the Earth.
2. They are largely polluting as they release a lot of carbon.	2. They are non-polluting as they do not release carbon.
3. They are not eco-friendly.	3. They are eco-friendly.
4. The fuels produced from conventional energy sources are comparatively costlier.	4. The fuels produced from non-conventional energy sources are comparatively cheaper.
5. Conventional energy power plants require less areas and their management cost is also less.	5. Non-conventional energy power plants require more areas and their management cost is also more.
6. These energy sources are non-renewable.	6. These energy sources are renewable.
7. Examples: Coal, petrol	7. Examples: Solar energy, wind energy

(3)

Organisms	Sketch	Classification
(a) Leech		Kingdom: Animalia Division: Non-chordata Phylum: Annelida
(b) Planaria		Kingdom: Animalia Division: Chordata Sub-phylum: Platyhelminthes

(4)

- (a) Transcription involves conversion of DNA to RNA.
 (b) The process by which RNA codes information for a protein is called translation.
 (c) tRNA contains an anticodon with complementary sequence to the codon on mRNA.

(5) **International organisations working for the environment:**

(Any three)

- International Union for Conservation of Nature (IUCN), Gland, Vaud, Switzerland
- Intergovernmental Panel on Climate Change (IPCC), Geneva
- United Nations Environment Programme, Geneva
- World Wildlife Fund (WWF), New York
- Bird Life International, Cambridge
- Green Climate Fund, Incheon, South Korea

(6) Hydroelectric power plants are advantageous but might also create some problems.

- Hydroelectric power generation does not need burning of fuels. Hence, there is no problem of combustion of fuels and release of toxic gases.
- Electricity can be obtained as and when required, if there is continuous supply of water.
- Water being a renewable resource gets replenished when there is plenty of rainfall.

- Construction of hydroelectric power plants however can have some serious consequences.
- Many villages and settlements get submerged when a dam or a reservoir is constructed.
- Although the displaced people are given re-settlement, it causes tremendous emotional trauma to the people.
- Biodiversity is affected as forest lands get submerged. The river flow is obstructed by the dam which affects the aquatic organisms residing in such water.
- Due to excessive pressure on land, the region is prone to earthquakes.

(7) The district control unit looks after the disaster management of the district. It is immediately formed either after the impact of the disaster or if warning is issued about some upcoming disaster.

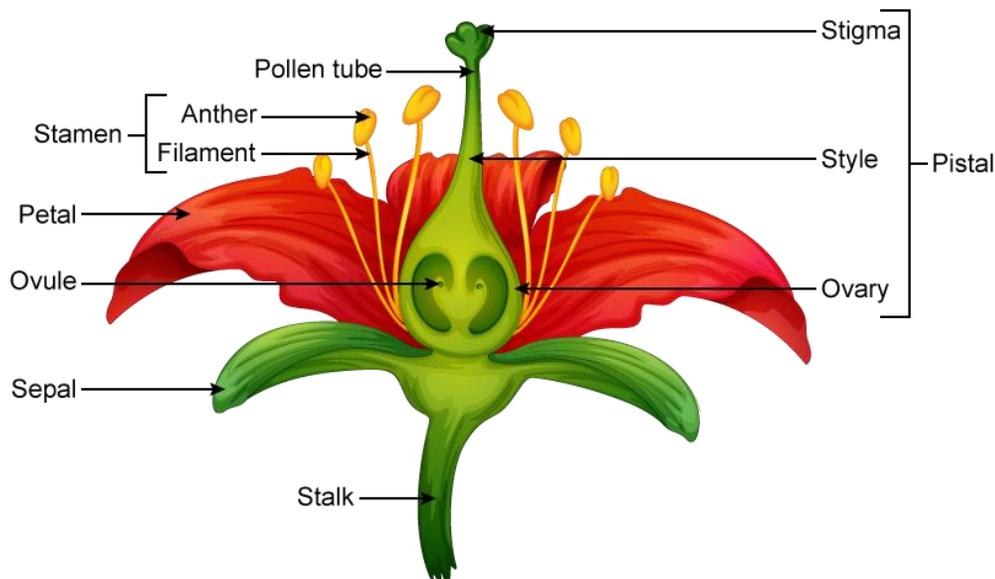
Role of the district disaster control unit:

- It reviews various aspects of disasters.
- It establishes continuous contact with various agencies like the army, air force, navy, telecommunication department and paramilitary forces for securing help.
- The unit also coordinates with various voluntary organisations for their help in disaster management.

4.

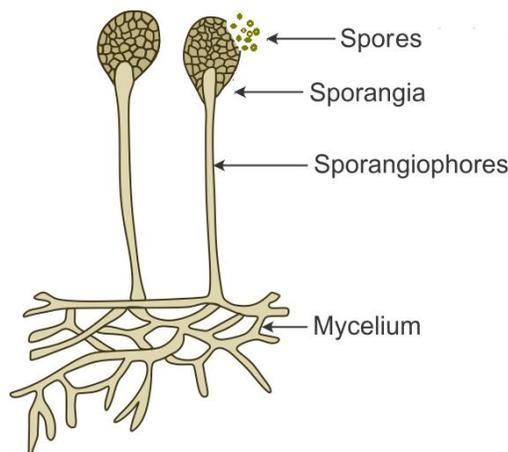
(1)

(a) **Structure of a flower:**



(b) *Mucor* reproduces asexually by spore formation.

- It has a filamentous body which possesses sporangia.
- When the spores are formed, the sporangia burst open. The spores are released which settle down at suitable places.
- They germinate in moist and warm places forming a new fungal colony.



(2)

- (a) The given figure shows a modern landfill site.
- (b) The landfill method is used for solid waste management.
- (c) In this method, only degradable waste matter collected in cities can be used. Such solid waste can undergo biodegradation and hence can be managed in an eco-friendly way.
- (d) From such decomposition, organic fertilisers and manures formed through composting are obtained. Methane gas is also obtained which is used as fuel.
- (e) Solid waste can be managed through incineration and composting.