# MT

**2018 ___ ___ 1100**

**MT - SCIENCE & TECHNOLOGY - II - I (72) - SEMI PRELIM - I : PAPER - 5**

**Time : 2 Hours** **(Model Answer Paper)** **Max. Marks : 40**

| | | |
|---|---|---|
| **A.1.** | **(A) Fill in the blanks :** | |
| (1) | Phenol oxidizing bacteria decompose the **xenobiotic** chemicals present in sewage. | **1** |
| (2) | BT cotton and BT brinjal are developed by using gene isolated from **Bacillus thuringiensis**. | **1** |
| (3) | Alcohol consumption mainly affects **nervous** system. | **1** |
| **A.1.** | **(B) Complete the corelation :** | |
| (1) | Insulin : Diabetes : : Interleukin : **Cancer** | **1** |
| (2) | Yoghurt : Lactobacilli delbrueckii :: coffee : **Lactobacillus brevis** | **1** |
| **A.1.** | **(C) Choose the correct alternative and rewrite the statement :** | |
| (1) | Very hard **parmesan** cheese is formed after ripening for 12 - 18 months. | **1** |
| (2) | Substance prepared by using yeast is **bread**. | **1** |
| (3) | Interferon is a group of small sized protein molecule used in treatment of **viral** disease. | **1** |
| (4) | Adulsa is taken to cure **cough**. | **1** |
| (5) | Each nuclear fission of uranium nucleus release **200 MeV** energy. | **1** |

**A.2.** **Answer the following questions : (Any Five)**

(1) **2**

| Sr. No. | Fruit | Microbe used | Role of microbe | Name of beverage |
|---|---|---|---|---|
| 1. | *Caffea arabica* | *Lactobacillus brevis* | Separating seeds from fruit | Coffee |
| 2. | *Theobroma cacao* | *Candida, Hansenula, Pichia, Saccharomyces.* | Separating seeds from fruit | Cocoa |
| 3. | Grapes | *Saccharomyces cerevisiae* | Fermentation of juice | Wine |
| 4. | Apple | *Saccharomyces cerevisiae* | Fermentation of juice | Cider |

(2) **2**

(i) Enzymes obtained by microbial process are active at low temperature, pH and pressure.

(ii) Hence enzymes mixed with detergents help in process of dirt/muck removal even at low temperature.

(3) **2**

(i) **Regenerative Therapy**:

(a) Cell Therapy : Stem cells are used to replace the dead cells in case of conditions like diabetes, myocardial infarction, Alzheimer's disease, Parkinson's disease etc.

(b) To produce blood cells required in conditions like anaemia, thalassaemia, leukemia etc.

(ii) **Organ Transplantation :** In case of failure of organs like kidney and liver, those can be produced with the help of stem cells and transplanted.

(4) **2**

| Pre-disaster management | Post-disaster management |
|---|---|
| (i) Identifying the pre-disaster areas. | (i) Providing all types of necessary help to victims of disaster. |
| (ii) Collecting the information about the intensity of disaster. | (ii) Participation of preferably local people saved from disaster. |
| (iii) Getting special training for disaster management. | (iii) Categorization of the help material received from control centre. |
| (iv) Increasing awareness about disaster management. | (iv) Being prepared for disaster rescue. |

(5) **2**

| Disaster | Symptoms | Effects | Remedial measures |
|---|---|---|---|
| **Flood** | (i) Heavy rains | (i) Heavy rains at the time of high tide | (i) Clean and clear blockage in drains |
| | (ii) Drainage blocked | (ii) Traffic disturbed | (ii) Rescue people |
| | | (iii) Causes accidents | |

(6) **2**

(i) Hydroelectric energy, solar energy and wind energy are all obtained without burning of a fuel; Hence no air pollution is caused and are eco friendly.
(ii) Sunrise, rainfall, wind are natural phenomena.
(iii) These phenomena are constantly and continuously happening on earth.
(iv) We have to design devices to trap these energies.
(v) By setting up hydroelectric power plant, solar panel and wind mills we can obtain these energies continuously uninterrupted at low cost. Hence these sources are called renewable energy sources.

**A.3. Answer the following questions : (Any Five)**

(1) **3**

Land filling sites :
(i) Composting is one of the best methods to dispose off degradable waste accumulated in urban areas.
(ii) Large pits are dug in open spaces far away from the residential area.
(iii) Pits are lined with plastic sheet/liner to avoid leaching of toxic and harmful materials which pollute the soil.
(iv) Compressed waste is dumped in the pit.
(v) It is covered with layers of soil, saw dust, leafy waste and specific biochemicals.
(vi) Bioreactors are mixed at some places.
(vii) Microbes present in the soil and other top layers decompose the waste.
(viii) Completely filled pit is sealed with soil slurry.
(ix) Best quality compost is formed after few days. Land filling sites can be reused after removal of compost.

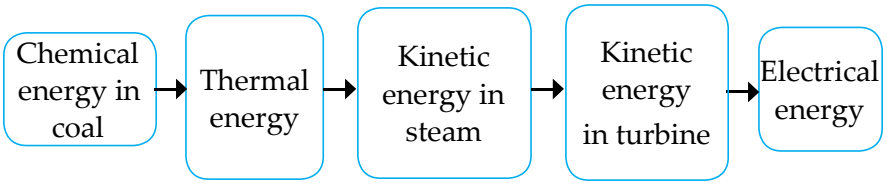
(2) **3**

All biodegradable waste can be converted into compost.
(i) Bacteria, fungi and actinomycetes are the microbes that decompose the organic matter.

| | | |
|---|---|---|
| | (ii) Aerobic bacteria are the most important ones.<br>(iii) Microbes break down the organic matter and produce carbon dioxide, water, heat and humus which makes it very nutritious.<br>(iv) They provide the most rapid and effective composting.<br>(v) Their excreta contains plant nutrients such as nitrogen, phosphorus and magnesium.<br>(vi) Actinomycetes are responsible for the earthy smell of the compost.<br>(vii) They decompose cellulose, starches and proteins liberating carbon, nitrogen and ammonia in the process, which are useful for higher plants.<br>(viii) Fungi breakdown cellulose and lignin and take over the final stage of composting.<br>(ix) Thus microbes help in recycling the nutrients through composting. | |
| (3) | Organ and Body donation :<br>(i) Many organs remain functional for certain period even after death occurs under specific conditions.<br>(ii) Organs or body donation can save life of other needful persons.<br>(iii) A miserable life can be made comfortable after death. Body can be made available for research in medical studies.<br>(iv) Awareness about these concepts is increasing in our country and people are voluntarily donating their bodies.<br>(v) Life of many people can be saved by organ and body donation.<br>(vi) Blinds can regain the vision.<br>(vii) Life of many people can be rendered comfortable by donation of organs like liver, kidneys, heart, heart-valves, skin etc.<br>(viii) Many government and social organisations are working towards increasing awareness about body donation. | **3** |
| (4) | (i) Competition has increased in education, employment and business due to increaseing population.<br>(ii) I with my parents will help my brother to relieve his stress by talking and discussing with him as expressing feelings helps to relieve stress.<br>(iii) It will also help him by giving him suggestions about how to cope up with studies and help him manage time.<br>(iv) I will advise him to go for regular exercise, yoga and meditation to improve concentration and relieve stress.<br>(v) I will explain him the importance of deep breathing, balanced diet and good food to relieve stress.<br>(vi) Also, I will advise him to take regular breaks from studies and nurture a hobby which will help him to relieve stress and concentrate better in studies. | **3** |

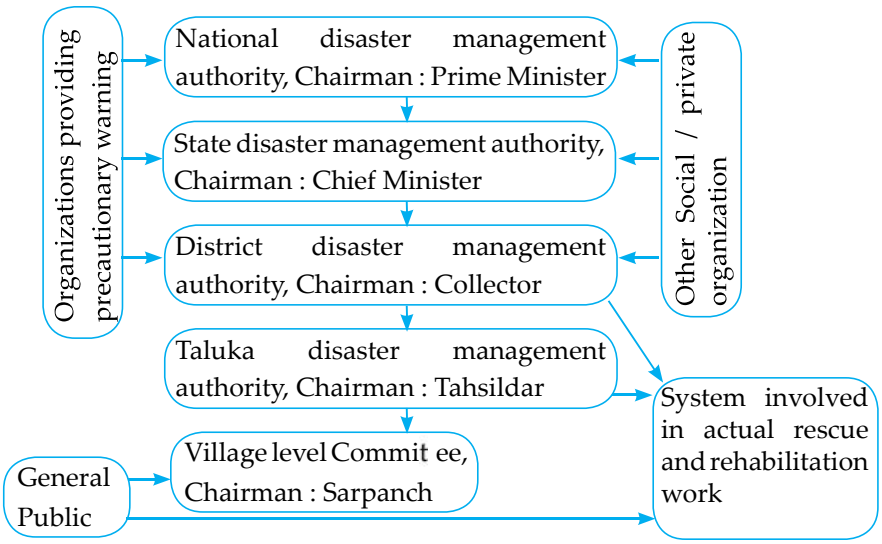
(5) (i) At the district level, the district collector is responsible for disaster management and implementation of rehabilitation schemes. **3**
(ii) District control unit is established immediately either after the impact of disaster or getting information about it.
(iii) It reviews about various aspects of disaster, keeps continuous contact with various agencies like army, airforce, navy, telecommunication department, paramilitary forces etc. for getting help.
(iv) It is also responsible for co-ordinating with various voluntary organizations for their help in disaster management.
(v) It tries to establish the normal condition and proper rehabilitation as early as possible.

(6) **3**




**A.4. Answer the following questions : (Any One)**

(1) Disaster Management authority : **5**
(i) In case of disaster management, there should be an attempt to minimize the losses.
(ii) Authority has been established at the level of the Government.
(iii) Disaster Management Act, 2005 has been passed in our country.
(iv) At the district level, district collector is responsible for disaster management and implementation of rehabilitation schemes.
(v) Collector is responsible for planning, co-ordinating and controlling the implementation of rehabilitation programme, gives out necessary instructions and reviews the entire system.
(vi) District collector is also responsible for designing the schemes for each district, separately for each type of disaster and getting those sanctioned from state level authorities.
(vii) District control unit is established immediately either after the impact of disaster or getting intimation about it. It receives information about various aspects of disaster, keeps continuous contact with various agencies.
(viii) It is also responsible for co-ordinating with various voluntary organization for their help in disaster management.
(ix) Disaster management is achieving or time to time improving the ability to face the disaster through scientific and careful observations.




(2) **Usefulness of biotechnology:** **5**

(i) Biotechnology has worked for human welfare.
(ii) There is considerable progress in the field of agriculture, pharmacy, plant as well as animal life.
(iii) Scientist have modified plants, animals, human beings using various techniques of biotechnology.
(iv) Biotechnology has modified shape, size, taste, seed/seedless fruits and vegetables.
(v) Reliable, rapid and consistent enzymes have been created which play a mojor role in food processing.
(vi) A number of dairy products are made available to us.
(vii) A number of human and animal diseases have found cure and prevention.
(viii) Biotechnology has modified plants to have their own pest resistant traits.
(ix) Diagnostic kits are available for various diseases.

**Harmful effects of Biotechnology are as follows.**

(i) High cost of genetic engineering apparatus.
(ii) Crosses between different species gives rise to hazardous organisms.
(iii) During experimentation when more Transgenic potatoes are grown, it can be life threatening.
(iv) Thus biotechnology should be balanced.

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