

Topic :- Microbes In Human Welfare

- 1 **(a)**
A germplasm is a collection of genetic resources for an organism. For plants, the germplasm may be stored as a seed collection. It includes, diverse alleles of all the genes of an organism.
- 2 **(b)**
Silk is composed of proteins. It consists of an inner part made up of fibroin protein and is covered with an outer envelope made up of sericrin protein. The silk thread contains 75-80% fibroin and 20-25% of sericin.
- 3 **(d)**
Jojoba is *Simendesia chinensis*. Its seed contain about 50% of liquid wax just like sperm whale oil. It is a drought resistant desert shrub. Now-a-days it is used as lubricant.
- 4 **(c)**
Hybridization involves simple process of emasculation and transfer of pollens from one flower to the stigma of other flower.
- 5 **(d)**
The dough used for making bread is fermented by *Saccharomyces cerevisiae* or commonly called baker's yeast. CO₂ released during the process of fermentation gives the puffy appearance to dough. It is used to make foods like idli, dosa, bread, etc.
- 6 **(c)**
The roots of shatavari (*Asparagus ramosus*) are used externally to cure chicken pox, small pox, measles etc.
- 7 **(d)**
Nitrifying bacteria (one of the chemosynthetic bacteria) oxidise ammonia to nitrites and obtain energy for the preparation of food. This oxidation

occurs in two steps. In the first step, ammonia is oxidised to nitrite by nitrite bacteria (e.g., *Nitrosomonas* and *Nitrococcus*). In the second step, nitrite is oxidised to nitrate by nitrate bacteria (e.g., *Nitrocystis* and *Nitrobacter*).

8 (a)

The ladybird and dragonflies are useful to get rid of aphids and mosquitoes, respectively.

(i) A bacteria species namely *Bacillus thuringiensis* (*Bt*) is known to kill a wide range of insects such as butterfly, caterpillars, ant etc., some strains of *Bt* can kill animal and plant parasitic nematodes, protozoans and even cockroaches

(ii) *Trichoderma* is a free-living saprophytic fungi that most commonly lives on dead organic matter in the soil and rhizosphere

(iii) The fungus is being developed as an effective biocontrol agent of several plant pathogens

(iv) *Rhizobium* is a symbiotic bacterium that lives in the root nodules of legumes and fixes atmospheric nitrogen into organic compounds

9 (d)

In *Bt* cotton, *Bt* means carrying an endotoxin gene from *Bacillus thuringiensis*. Specific *Bt* toxin gene were isolated from *Bacillus thuringiensis* and incorporated into the several crop plants such as cotton, corn. The choice of genes depends upon the crop and the targeted pest as most *Bt* toxins are insect group specific. The toxin is coded by a gene named *cry*

10 (c)

Cyanobacteria fix atmospheric nitrogen and increase the organic matter of the soil through photosynthetic activity, e.g., *Nostoc*, *Anabaena*, *Oscillatoria*, etc.

11 (c)

Insecticide pyrethrum is obtained from the plant *Chrysanthemum*.

12 (c)

Rhizobium is found in the roots nodules of leguminous plants. It is a nitrogen fixing symbiotic bacterium which increases the fertility

- of soil, hence *Rhizobium* is called bacterial fertilizer.
- 13 **(c)**
Beverages are formed by fermenting malted cereals and fruit juices with *Saccharomyces cerevisiae* or brewer's yeast to produce ethanol
- 14 **(d)**
According to union petroleum minister, 5% of alcohol (ethanol) will be mixed in petrol for meeting energy needs.
- 15 **(c)**
The chemical substances produced by some microbes which can kill or retard the growth of other microbes are called antibiotics. The term antibiotic was coined by Waksman (1942). Penicillin was the first antibiotic to be discovered by Alexander Flemming (1928)
- 16 **(c)**
An important part of the biological farming approach is to become familiar with the various life forms that inhabit the field, predators as well as pests and also their life cycles, patterns of feeding and the habitats that they prefer. This will help to develop appropriate means of biocontrol
- 17 **(b)**
Cotton is obtained from the epidermal hair present on the surface of seeds of *Gossypium* sp. These are made up of cellulose only and may be of two types, *i.e.*, extractable lint and non-extractable fluffy fuzz. Cotton fibres are mainly used for textiles, celluloid, cellophane, rayon and paper pulp.
- 18 **(a)**
Toddy is a traditional drink of Southern India. It is made by fermentation of sap from palm tree by bacteria
- 19 **(b)**
Biogas generation is a three stages anaerobic digestion of animal and other organic wastes by methanogenic bacteria
(i) breakdown of polymers
(ii) conversion of monomers into organic acids by fermentation microbes

(iii) generation of methane by methanogenic bacteria (conversion of organic acids into CH₄ and CO₂)

20 (a)

Cork is obtained from *Quercus suber*.

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	A	B	D	C	D	C	D	A	D	C
Q.	11	12	13	14	15	16	17	18	19	20
A.	C	C	C	D	C	C	B	A	B	A

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