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Solution 01:
Micronutrients
(i) They are required in very small quantities.
(ii) They are involved in enzyme activity and electron transport.
Example - Iron, Zinc
Macronutrients
(i) They are required in large quantities.
(ii) They have no significant role in enzyme activity and electron transport.
Example - Nitrogen, Calcium
Solution 02:
Source: (i) Air
Nutrients:
Carbon (C)
Oxygen (O)
Hydrogen (H)
Source: (ii) Water
Nutrients:
Nitrogen (N)
Phosphorus (P)
Potassium (K)
Calcium (Ca)
Magnesium (Mg)
Source: (iii) Soil
Nutrients:
Iron (Fe)
Manganese (Mn)
Boron (B)
Zinc (Zn)
Copper (Cu)
Molybdenum (Mo)
Chlorine (Cl)
Sulphur (S)
Solution 03:
Plants get nutrients through air, water and soil.
Solution 04:
Nitrogen, phosphorus and potassium.
Solution 05:
Iron - Micronutrients.
Chlorine - Micronutrients.
Sulphur - Macronutrients.
Copper - Micronutrients.
Nitrogen- Macronutrients.
Calcium- Macronutrients.
Manganese- Micronutrients.
Potassium- Macronutrients.
Zinc- Micronutrients.
Magnesium- Macronutrients.
Molybdenum- Micronutrients.
Phosphorus- Macronutrients.
Solution 06:
Advantages of manures are:
(i) Manures are natural fertilizers.
(ii) Manures are bulky sources of organic matter which supply

nutrients in small quantity and organic matter in large quantities.
Solution 07:
Limitations of using manures are:
(i) Manures are not nutrient specific.
(ii) Manures are not able to fulfill the high and rapid demand of nutrients required by improved high-yielding hybrid varieties of crops.
Solution 08;
Manure contains many organic substances of biological origin which can be easily degraded and absorbed by plants. It helps in recycling of biological waste. Manures increase the fertility of soil for long duration without causing any harm. However, the chemical fertilizers (e.g. urea) improve soil fertility for short duration but cause environmental hazard. Continuous use of fertilizers in a particular area / crop field causes destruction of soil fertility.
Solution 09:
Advantages of fertilizer over manure:
(i) Fertilizers are very rich in plant nutrient whereas manure contains small amounts of essential plant nutrients.
(ii) Fertilizers are soluble in water whereas manure is not soluble in water.
Solution 10:
As a result of this, the pond water would acquire a high concentration of nitrates and phosphates which would result in the excessive growth of algae and phytoplankton in the pond.
Solution 11:
Eutrophication is a process whereby water bodies, such as lakes or slow-moving streams receive excess nutrients that stimulate excessive plant growth (algae, phytoplankton's and nuisance plants weeds). This enhanced plant growth is also termed as an algal bloom.
Example: During rains the nutrients from the fields are washed away and get accumulated in nearby water bodies.
Solution 12:
The continuous use of chemical fertilizers in a particular area or crop field leads to loss of soil fertility.
Solution 13:
There are three methods of fertilizer applications in practice:
(i) Broadcasting: Uniform distribution over the whole cropped field.
(ii) Placement: Application in bands or in pockets near the plants or plant rows.
(iii) Foliar application: Using low or high volume sprayers, the fertilizers are sprayed covering the plants.
Solution 14:
Farmyard Manure
It is the decomposed mixture of cattle excreta, dung, urine, litter and left over organism matter such as roughage and Fodder.
Compost Manure
It is prepared from farm and town refuge such as vegetable and animal refuse.
Solution 15:
Manure - Manures are natural fertilizers. They are bulky sources of organic matter which supply nutrients in small quantities, and organic matter in large quantities. There are different types of manures: Farmyard manure (FYM), Compost, Green manures and Vermicompost.
Manures affect the soil in following three ways:
(i) Manures enrich the soil with nutrients. They replenish the general deficiency of nutrients in the soil. Since manure contains fewer nutrients they need to be used in large quantities.
(ii) Manures add organic matter (called humus) to the soil which restores the soil texture, for better retention of water and aeration of soil.
(iii) The organic matter in manures provides food for the soil organisms, (decomposers such as bacteria, fungi, etc. which help in

providing nutrients to plants.
Solution 16:
Green manuring is the practice which includes growing, mulching by ploughing and mixing of green crops with soil, to improve physical structure and soil fertility.
Example - Sunn hemp (Crotalaria juncea).
Solution 17:
Fertilizers - Fertilizers are one of the major components for obtaining higher yields especially in expensive farming practices.
Fertilizers are divided into following four groups:
(i) Nitrogenous fertilizers - These fertilizers supply the macronutrient nitrogen.
Example - Urea, $CO(NH_2)_2$
(ii) Potassic fertilizers - These fertilizers supply potassium which is one of the essential macronutrient of the plants.
Example - Potassium sulphate, K_2SO_4.
(iii) Complex fertilizers - These fertilizers contains two or more nutrients.
Example - Nitrophosphate
Solution 18:
Biofertilisers - Organisms which enrich the soil with nutrients are called biofertilisers. Biofertilisers are used for the specific crop plants such as pulses, legumes, oil seeds and rice. They are renewable and non-pollutant sources of plant nutrient such as nitrogen.
Nitrogen fixing microorganisms, i.e., non-symbiotic and symbiotic cyanobacteria and phosphate-solubilising microorganism are the main type of biofertilisers.
Solution 19:
A legume crop does not require nitrogenous fertilizers because its roots have root nodules which have nitrogenous bacteria called Rhizobium. This bacteria fixes atmospheric nitrogen and the plants converts nitrogen into various nitrogenous compounds.
Solution 20:
Irrigation is essential for the absorption of nutrient elements by the crop plants from the soil. The irrigation water tends to dissolve the nutrients present in the soil of a crop field to form a Solution. This Solution of nutrients is then absorbed by the roots of crops for the development of the plants.
Solution 21:
Excessive irrigation causes water logging and increases surface salinity which leads to soil salinity.
Solution 22:
Effects of excessive irrigation:
(i) It causes water logging.
(ii) It increases salinity in the soil.
(iii) The roots do not get proper aeration due to which they die.
Solution 23:
Water should be used judiciously because:
(i) It helps in the cultivation of crops.
(ii) In desert areas where there is scarcity of water, it is supplied through irrigation practices to prevent drought.
Solution 24:
Advantages of irrigation:
(i) It is necessary to provide sufficient moisture for the germination of seeds.
(ii) Irrigation of crop plants is essential for the growth and elongation of roots of the crop plants.
(iii) It is necessary to increase the number of aerial branches in crop plants.
(iv)It is essential for the absorption of nutrient elements by the crop plants from the soil.
Solution 25:
The efficiency of irrigation can be increased by:
(i) Drip and sprinkler system - It increases the efficiency of

irrigation as it sprays water through pipes and a sprinkler.
(ii) River lift system - It is useful in those areas where canal flow is insufficient or irregular due to inadequate water release. The water is directly drawn from the rivers for supplement irrigation.
Solution 26:
There are two main factors responsible for loss of grains during storage:
(i) Biotic factors - Insects, rodents, birds, mites and bacteria.
(ii) Abiotic factors - They include moisture, temperature and other non-living environmental factors.
Solution 27:
Biotic and abiotic factors which cause destruction of grains during storage can be prevented by the following methods:
(i) Drying - The harvested food grains should be dried by spreading them over plastic sheets or cemented floors. All the sun dried food grains are allowed to cool to room temperature before storing them.
(ii) Cleaning - The grains should be properly cleaned before storage. They should be filled in new gunny bags before keeping in godowns, warehouses or stores.
Solution 28:
Drying - The harvested food grains is dried by spreading them over plastic sheets or cemented floors. All the sun dried food grains are then allowed to cool to room temperature before storing them.
Solution 29:
For the storage of grains, grain silos are used. The silos are big and tall cylindrical structures. They are provided with outlets at different levels to withdraw the desired stock of grains. They have built in arrangement for aeration, temperature control, protection from insects, rats, birds etc.
Solution 30:
Field crops are infested with a variety of pests. There are various methods by which insects and diseases can be controlled. One of the most common and effective methods is the use of pesticides or biocides which include insecticides (for killing the insects), weedicides (for killing the weeds) and fungicides (for killing the fungi). Thus chemicals used to kill the pests, e.g. weeds; insects, mites, rodents and fungi are called pesticides. These chemicals are sprayed on crop plants or used for treating seeds and soil.

********** END **********