CBSE Class 12 Biology
Important Questions
Chapter 9
Strategies for Enhancement in Food Production

3 Marks Questions

1. What is micropropagation? Why are plants produced by this technique called somaclones? Name any two food plants which are produced on commercial scale using this method.

Ans. The method of producing many plants through tissue culture is called micropropagation.

The plants produced through micropropagation will be genetically identical to the original plant from which they were grown, hence are called somaclones.

Tomato, banana, apple are produced on commercial scale using this method.

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2. What is mutation? Explain the significance of mutation in plant breeding. Give an example of a disease resistant variety of cultivated plant induced by mutation.

Ans. Mutation : Sudden inheritable change in the characters of an organism due to change in the sequence of bases in the gene(s).

Mutation results in a new character or trait, not found in the parental type It can also be induced by using mutagens like gamma radiations.

Such plant materials are used as such or used for breeding new variaties.

Mung bean resistance to yellow mosaic virus and powdery mildew.

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3. How can we improve the success rate of fertilisation during artificial insemination in aminal husbandary programmes?

Ans. The Multiple Ovulation Embryo Transfer (MOET) technology can improve the success

rate of fertilisation.

In the procedure, a cow is given hormonal treatment (FSH), so that more than one ova/eggs (6-8) are produced per cycle. After mating or artificial insemination the embryos at 8-32 celled stage, are transferred to different surrogate mother cows. This technology has been successfully used for cattle sheep, rabbit, mares and buffalloes.

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4. Biofortification is the most practical means to improve public health. Justify the statement with examples.

Ans. Biofortification is the plant breeding programme designed to increase Vitamins, minerals, heigher proteins and healthier fat content in crops. This programme improves the quality of food products. It is required to prevent hidden hunger. Some of the examples of fortified crops are:

(i) New hybrid of maize : has twice the amount of amino acid lysine and tryptophan.

(ii) Wheat : Atlas 66, having a high protein content.

(iii) Rice : 5 times iron than the normal amount. IARI Delhi has released several crops which are rich in vitamins and minerals. Consumption of such biofortified food will vastly improve the public health.

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5. What is meant by germplasm Collection? Describe its significance in plant breeding programmes.

Ans. The collection of all the diverse alleles of all the genes of crop plant is called germ plasm collection.

In plant breeding programmes, the germplasm provides the entire of genes and alleles, and the characterstics which they express. The plant breeders select the most favourable characters of a particular gene and manipulate its transfer to a desirable parent.

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6. To which product, following products are related (a) Blue revolution (b) white revolution (c) Green revolution

Ans. (a) Fish production (b) Milk production (c) Crop production

7.What measures would you undertake to improve the quality & quantity of milk production?

Ans. The quality & quantity of milk production depends on three factors :-

1. Genetic makeup.
2. Nutrition &
3. Environment

Thus, the following steps should be taken to improve management of livestock :-

a.SHEDS :- Sheds should be neat & clean, well – ventilated with pucca floor & will drained channel.

b.BALANCED DIET :- a balanced feed consists of appropriate quantities of carbohydrates, proteins, vitamins, minerals & water. The feed consists of two main components :-

i.Roughage – include fodder, hay, straw & Silage.

ii.Concentrates – broken forge crops, grams, cereals, mullets, cotton, seeds.

a.CLEAN WATER :

b.HEALTH CARE:- It requires regular inspection with proper record keeping.

8.What is "tissue culture". What are the steps involved in tissue culture?

Ans."Tissue culture is an experimental process through which a mass of cells (callus) is produced froman explant tissue & used directly to regenerate plant It invoices following steps :-

1. Selection of an elite plant
2. Preparation of suitable culture media
3. Sterilisation of an explant & inoculation on culture media under controlled temp ~ 250 c in light
4. Callus induction in explant.

5. Organogenesis :- a high cytokine : auxin ratio induce Shoot formation while high auxin : cytokinin ratio induce root formation.
6. Acclamatization :- test tube rooted plantlets are first subjected to acclimatization in green house & then transferred to the field.

9.What are the measures that need to be taken for effective poultry farm management?

Ans.i) It requires a crowd – free, rainproof, well ventilated & protected brood house.

ii).Brood house should be clean & disinfected.

iii).Good drainage system.

iv).Proper fed & clean & fresh drinking water.

v).Proper light management for optimum egg production.

vi).Poultry are more sensitive to heat so, measures should be adopted to overcome heat shock.

a).Sheds should be covered with grass or low vegetation.

b).Provide sprinklers on roof.

c).Maximum Ventilation.

vii)Disease – free & suitable breeds should be selected for breeding.

10.The steps in a programme are :-

Collection of germplasm, crossbreeding the selected parents, selection superior recombinant progeny & Testing, releasing & marketing new cultivars?

i) What is this programme related to?

ii) Name two special qualities as the basis of selection of progeny.

iii) What was the outcome of the programme?

iv) What is the popular term given to this outcome? Also name the India Scientist who is credited with chalking out of this programme.

v) Among the above – mentioned step which is the most crucial step of this programme& why?

Ans. i). Plant breeding.

ii). Disease resistance & yield.

iii). Production of improved varieties.

iv). The popular term give to this outcome is HYBRID. Dr. S. Swamminathan is credited with chalking out of this programme.

v). Selection of superior progeny is the most crucial step of this programme because it yields plants thatare superior to both parents & are then self – pollinated for several generations.

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11. What is apiculture? What are the requirements to consider for bee–keeping?

Ans.The culturing of honey bees for the production of honey or beewax is called Apiculture.

Bee – keeping can be practised in any area where there is sufficient bee pastures of some wild shrubs, fruits orchards & cultivated crops. The following points are important for successful bee – keeping :-

1. Knowledge of nature & habits of bee.
2. Selection of suitable location of keeping beehives.
3. Catching & hiving of swarms.
4. Management of beehives during different seasons.
5. Handling & collection of honey &beewax.

12.What are the major steps involved in Plant breeding?

Ans.The major steps involved in plant breeding are :-

i). Collection of varieties :- collection & preservation of all the different wild varieties, species & relatives ofthe cultivates species.

ii). Evaluation & Selection of Parents :- Germplasm collected is evaluated to identify plants with desirablecharacter. The selected plants are multiplied & used.

iii). Hybridisation of Selected Parents :- The selected parents are hybridized so that the traits in them can becombined in the hybrid progeny.

iv). Selection & Testing of Superior Recombinants :- Individuals with desired combination of characters haveto be selected from among the progeny. Such hybrids are superior to both the parents.

v). Testing, Release & commercialization of New cultivars :-

Evaluation is done by growing these plants in the research field & recording their performance under ideal conditions of irrigation, fertilizers & other crop practices. The selected plants are then tested in the farmer's field for at least three growing seasons. The material thus selected is certified & released as a variety.