

## Important Questions - Strategies for Enhancement in food Production

12th Standard CBSE

**Biology**

Reg.No. :

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Time : 01:00:00 Hrs

Total Marks : 50

**Section - A**

- 1) In hybridization, the haploids combine the advantages of 1  
(a) Recombination (b) Segregation (c) Fixation (d) All of them
- 2) Which one of the following substance is responsible for callus formation 1  
(a) 2,4-D (b) NAA (c) BAP (d) PEG
- 3) In tissue cultural medium, the embryoids formed from pollen grains is due to 1  
(a) Cellular totipotency (b) Organogenesis (c) Double fertilization (d) Test tube culture
- 4) Haploid plantlets can be produced by 1  
(a) Pollen culture (b) Cotyledon culture (c) Embryo culture (d) Meristem culture
- 5) Selection of homozygous plant is 1  
(a) Mass selection (b) Pure line selection (c) Mixed selection (d) None of the above
- 6) A cybrid is a hybrid carrying 1  
(a) cytoplasm of two different plants (b) genomes and cytoplasm of two different plants  
(c) cytoplasm of two different plants and genome of one plant (d) genomes of two different plants  
(e) cytoplasm of several plants and genomes of two plants
- 7) Spirulina is the rich source of 1  
(a) Protein (b) Vitamins (c) Minerals (d) All of these
- 8) Name the two varieties of rice from which semi-dwarf varieties have been developed. 1
- 9) Write the names of the two millet crops in which hybrids have been developed in India 1
- 10) Name two diseases caused by viruses in crop plants. 1

**Section - B**

- 11) Explain giving reasons, the need to keep beehives in the fields during flowering seasons. 2
- 12) List any four important components of poultry farm Management. 2
- 13) List any four objectives that you would recommend for biofortification. 2
- 14) Following are the steps in Moet program-me for herd improvement in which a cow has been administered hormones with FSHlike activity. Arrange steps A to D in their correct sequence. A - Transferred to a surrogate mother. B - It is either mated with an elite bull or artificially inseminated. C - Fertilised eggs at 32 cell stage are recovered non surgically. D - it produces 6-8 eggs instead of one egg which they normally yield per cycle. 2

- 15) The steps in a programme are: - Collection of germplasm - Crossbreeding the selected parents - Testing, releasing and marking new cultivars. (i) What is this programme related to? (ii) Name two special qualities as basis of selection of the progeny (iv) What is the popular term given to this outcome? Also name the indian scientist who is credited with chalking out of this programme. 2
- 16) What are the disadvantages of conventional hybridisation in plants? 2
- 17) Why are biofortified maize and wheat considered nutritionally improved? 2
- 18) (a) What is the programme called, that is involved in improving sucess rate of production of desired hybird and herd size of cattle? (b) Explain the method used for carrying this programme for cows. 2
- 19) Outcrossing and cross-breeding are two breeding practices in animal husbendry. how are the two practices different from each other and wghat adavantage are they to breeders? Explain. 2
- 20) Make corrections wherever you find mistake in spelling/words in the following paragraph/sentence. 2
- A. A successful breeding for disease susceptibility depends mainly on two factors: (i) a good source of resistance, and (ii) a dependable disease test. In disease rest, all the plants are grown under conditions in which a resistant plant is expected to develop disease. This allows a clear cut identification of the disease resistant plants, which are then discarded.
- B. Humans have produced a new autopolyploid crop called triticale in the following manner. Autoteraploid wheat (*Triticum Sativum*) was hybridised with rye (*Seeale cereale*). The chromosome number of the resulting  $F_1$  was tripped to produced triticale.
- C. Phenotype is the genetic make up of an individual or a variety. In contrast, the genotype is the observable features of an organism.

### Section - C

- 21) Name the methods employed in animal breeding. According to you which one of the methods is the best? Why? 5
- 22) Enumerate the points that have to be considered for successful bee-keeping. 5
- 23) How are morphological and biochemical/physiological charracteristics of plants associated with resistance to insect pets? Give any five examples of the features and the name of the pest, which each is resistant to. 5
- 24) During the explanation of the significance of several breeding techniques, teacher makes a statement about inbreeding depression and suggested a solution for it. Pallavi became very curious about knowing all this and asked certain questions to his teacher. 5
- (i) Why is breeding required?
- (ii) What is the significance of improved variety?
- (iii) What is interspecific hybridization?
- (iv) What values are shown by Pallavi as a science student?

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### Section - A

- 1) (d) All of them 1
- 2) (a) 2,4-D 1
- 3) (a) Cellular totipotency 1

- |   |   |
|---|---|
| 4) (a) Pollen culture                             | 1 |
| 5) (b) Pure line selection                        | 1 |
| 6) (a) cytoplasms of two different plants         | 1 |
| 7) (a) Protein                                    | 1 |
| 8) Sonalika and kalyan sona.                      | 1 |
| 9) Jowar and Bajra                                | 1 |
| 10) Tobacco mosaic. yellow mosaic in bhindi(okra) | 1 |

### Section - B

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|--|---|
| 11)  | 2 |
| <p>During flowering seasons, the honey-bees visit a number of flowers in search of edible pollen and nectar; since they collect nectar from a large number of flowers, honey collection improves during flowers seasons.</p>   |   |
| 12)  | 2 |
| <p>The important components of poultry farm management include: (i) Selection of disease- free and suitable breeds. (ii) Proper and safe farm conditions. (iii) Proper feed and water. (iv) hygiene and health care.</p>   |   |
| 13)  | 2 |
| <p>The objectives of biofortification are to improve/increase: (i) protein content and quality (ii) oil content and quality (iii) vitamin content (iv)micronutrient and mineral content.</p>   |   |
| 14) $D \rightarrow B \rightarrow C \rightarrow A$  | 2 |
| 15)  | 2 |
| <p>(i) Plant breeding / Raising of new varieties of a crop (ii) High yield, disease resistance, semi dwarfness,high protein content. (iii) New hybrid varieties of plants have been produced, and there is an increased yield. (iv) Green revolution M.S. Swaminathan</p>  |   |
| 16)  | 2 |
| <p>(i) Conventional breeding can use only those genes that are present in such species that can be hybridised. (ii) Changes occur in all those traits for which the parents used for hybridisation differ from each other.</p>   |   |
| 17)  | 2 |
| <p>Biofortified maize and wheat are considered nutritionally improved, because of following reasons:</p> <p>(i) Maize hybrids have twice the amount of amino acid. lysine and tryptophan as compared to existing maize hybrids</p> <p>(ii) Atlas 66 has been used as a donor for developing wheat varieties with improved protein content.</p> |   |

18)

2

(a) Multiple ovulation Embryo Transfer , (MOET) technology

(b) Steps in MOET technology:

- A cow is administered hormones with FSH-like activity to induce follicular maturation and superovulation, i.e. instead of one egg, 6-8 eggs are produced per cycle.
- The animal is either mated with an elite bull or artificially inseminated.
- The fertilised eggs are recovered at the 8-32 celled stages, nonsurgically.
- They are then transferred to surrogate mothers.
- The genetic mother is available for and her round of superovulation.

19)

Outcrossing	Cross-breeding
<p>-Outcrossing refers to the mating of animals within the same breed, but having no common ancestor on either side their pedigree up to 4-6 generations.</p> <p>- A single outcrossing helps to overcome inbreeding depression</p>	<p>- Cross-breeding is the mating of a superior selected male of one breed with the selected female of another breed.</p> <p>- Cross-breeding allows combining of desirable qualities from the two breeds.</p>

2

20)

2

A. A successful breeding for disease resistance depends mainly on two factors: (i) a good source of resistance, and (ii) a dependable disease test. In disease test, all the plants are grown under conditions in which a susceptible plant is expected to develop disease. This allows a clear-cut identification of the disease-resistant plants, which are then selected.

B. Humans have produced a new allopolyploid crop called Triticale in the following manner.

Allotetraploid wheat (*Triticum turgidum*) was hybridised with rye (*Secale cereale*). The chromosome number of the resulting  $F_1$  was double to produced Triticale.

C. Genotype is the genetic make up of an individual or a variety. In contrast, the phenotype is the observable features of an organism

### Section - C

21)

5

The methods employed in animal breeding are:

A. Natural methods. These are as follows:

(a) Inbreeding.

(b) Outbreeding which may be done by:

(i) Outcrossing

(ii) Cross breeding

(iii) Interspecific hybridization

B. Artificial methods. They include super ovulation and embryo transplantation, and multiple ovulation embryo transfer technology (MOET.)

Out of these methods, cross breeding is the best method of animal breeding because it is breeding between the superior males of another superior female breed. It allows the desirable qualities of two different breeds to be combined and give the best quality of yield

## 22) Successful bee keeping

- It requires the following considerations:
  - (i) Knowledge of the nature and habits of bees.
  - (ii) Selection of suitable location of keeping beehives.
  - (iii) Catching and hiving of swarms.
  - (iv) Management of beehives at different seasons.
  - (v) Handling and collection of honey and beeswax.

## 23)

## Resistance to Insect Pests

- Resistance to insect pests is genetically controlled and manifested in the form of morphological, physiological or biochemical characteristics.

- A few examples are given below:

- (i) Wheat - Hairy leaves
  - Resistance to cereal leaf beetle.
- (ii) Maize - High aspartic acid and low nitrogen and sugar contents
  - Resistance to stem
- (iii) Wheat - Solid stem
  - Resistance to saw fly
- (iv) Cotton - Smooth leaves and nectarless condition.
  - Resistance to bollworm.
- (v) Cotton - Hairy leaves
  - Resistance to jassids

## 24)

- (i) Breeding is a necessary process among organism through which the progeny of animals are produced with a variety of improved characters (under controlled conditions).
- (ii) Improved variety of animals and plants have higher and better quality of products.
- (iii) The hybridization process in which animal of one species is hybridized with animal of other species is called interspecific hybridization.
- (iv) Pallavi is an attentive student who correlates the scientific knowledge in her daily life.