

# **PACE MEDICAL**

## SOLUTIONS

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### STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION

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#### **Exercise**

1. Meristems are generally free from viruses.
3. Mutation is a sudden and heritable change in a character of an organism. Mutations can be due to a change in base sequence of a gene or chromosome structure. They can be induced by physical mutagens like gamma-rays, X-rays etc.
6. Inbreeding is mating of individuals closely related by ancestry. It is used to develop pure lines or homozygous lines.
10. Pure line – Population of individuals homozygous for one or more allelic pairs.
12. Microspores are haploid, thus, microspore culture results in haploid embryoids.
13. When chromosome number of a haploid plant is doubled by using colchicines, homozygous diploid plants can be obtained.
17. Autopolyploidy involves numerical increase of same genome. It can be induced by colchicines, which allows doubling of chromosomes, but spindle is not formed.
21. Pollen is haploid. Hence, pollen of a plant ( $2n = 28$ ) has  $n = 14$  chromosomes. Pollen culture generates haploid plants. Hence callus cell has 14 chromosomes.
22. Hybrid vigour is phenotypic superiority of hybrid over either of its parents which are unrelated. Inbreeding leads to loss of hybrid vigour due to increase in homozygosity of recessive alleles.
23. Wild varieties must be conserved as they are the source of genetic variability.
36. The hybrid embryos resulting from interspecific or intergeneric crosses may collapse due to incompatibility. Such embryos can be isolated and rescued by growing on artificial media, by the technique of embryo culture.

#### **Assertion – Reasons**

4. Autopolyploids like autotriploids are sterile while autotetraploids have relatively lower fertility than diploid forms. Allopolyploids are fertile.
9. The spontaneous variations which appear in cells or tissues in artificial medium are called somaclonal variations. Variations do occur in nature spontaneously.

**Previous year's questions**

1. Cells of anther wall are diploid while exine, vegetative cell and generative cell of pollen are haploid.
2. Androgenic haploids can be developed from haploid young pollen. Anther wall, tapetum, connective tissue is diploid.
7. Virus free plants can be obtained by shoot tip culture as apical meristem in shoot tip is generally free of viruses.
14. Cellulase and pectinase digest cellulose and pectin of cell wall.
24. Protoplasts are made to fuse by means of electrofusion or by chemicals like polyethylene glycol.
26. BT cotton plants are resistant as they possess *Bacillus thuringiensis* gene 'cry'.
27. *Azolla* has symbiotic association with blue green algae, *Anabaena*. *Anabaena* carries out nitrogen fixation.
28. Rhizobia in legume root nodules fix atmospheric nitrogen.
29. VAM is vesicular Arbascular mycorrhiza and is involved in mineral absorption, particularly phosphates.
49. *Pseudomonas putida* is genetically engineered to digest oil.
60. Organogenesis is controlled by hormones - auxins and cytokinins.