



Blue Print (As per PU Board)

Topic	1 mark questions	2 marks questions	3 marks questions	5 marks questions	Total Marks
Strategies for Enhancement of Food Production	3	–	3	2	22

One mark questions

- Why is the south Indian sugarcane preferred by agriculturists?**
Answer: It has thicker stem and higher sugar content
- What is poultry?**
Answer: Rearing of birds such as chicken, ducks and turkey for the purpose of meat.
- What is Totipotency?**
Answer: The ability of plant cell to develop into a complete plant.

Two marks questions

- Which are the two rice varieties used to develop semi-dwarf rice variety in 1966 in India?**
Answer: IR-8 and Taichung Native - I
- Name the improved characteristics of wheat that helped India achieve green revolution?**
Answer: → Semi - dwarf nature
→ Quick yielding feature
→ High yielding feature
→ Disease resistance feature
- What is meant by germplasm collection? What are its benefits?**
Answer: The collection of all the diverse alleles of all. The genes of a crop plant is called germplasm collection. The breeder selects the most favourable characters of a particular gene and manipulates its transfer to a desirable plant

Three marks questions

- Define**
 - Out crossing**
 - Cross breeding**
 - Interspecific hybridisation**

Answer: (a) Out crossing: It is the mating between animals of same breed, but not having common ancestors for 4-6 generations
(b) Cross breeding: it is a cross between two different species. It is the mating between superior male of one breed with superior female of another breed
(c) Interspecific hybridisation: Males and females of different, but related species are mated. Progeny has desirable features of both the species
- Write a note on mutational breeding with an example.**
Answer: It is a process by which genetic variations are created through changes in the basic sequence within genes resulting in the creation of a new character or trait not found in the parental type
It is possible to induce mutations artificially through use of chemicals or radiations like gamma radiations. Chemicals like colchicine, ethyl methane sulphonate etc, later selecting and using that plants have the desirable character as a source in breeding is called mutation breeding
Example: Mung bean resistance to yellow mosaic virus and powdery mildew were induced by mutations.
- IARI, New Delhi has developed some bio fortified plants which are rich in some nutrients. Name the nutrients and the plant in which they are desired** (II, III)
 - Vitamin A enriched carrots, spinach, pumpkin.



- (b) Vitamin C enriched bitter guard, bathua, mustard, tomato
- (c) Iron and calcium enriched spinach and bathua
- (d) Proteins enriched beans – broad, lablab, French, garden peas

Five marks questions

10. (a) Define tissue culture (II, III)

(b) What are explants? Which part of the plant would you select as explants to produce virus free plants?

(c) What do you mean by somatic hybridisation? Mention an example:

Answer: (a) The technique of growing whole plants in culture medium using explants under sterile condition called tissue culture

(b) Parts of the plant used in tissue culture experiment are called explant. Meristem (opical and axillary) are used as explants to produce virus free plants.

(c) the process of fusion of protoplasts of two different varieties of plants to produce a hybrid is called somatic hybridization

Example: protoplast of potato is fused with that of tomato to produce a hybrid called pomato

11. What are controlled breeding techniques? Describe the following controlled animal breeding techniques and mention their significance (II, III)

(a) Artificial insemination

(b) MOET

Answer: The artificial breeding techniques carried out using artificial insemination and multiple ovulation embryo transfer technology for the genetic improvement of animals are called controlled breeding techniques

(a) Artificial insemination (AI): Semen of superior male is collected and introduced into the reproductive tract of selected female

Significance:

- It helps to overcome several problems of natural mating
- The semen can be frozen and used in later stages
- Frozen semen can be easily transported
- Spread of certain disease can be controlled by this method

(b) MOET (Multiple ovulation embryo transfer)

→ Cow is administered with hormones like FSH for inducing follicular maturation and super ovulation

→ Cow produces 6-8 eggs instead of one egg

→ Cow is mated with bull or artificially inseminated

→ Fertilized eggs at 8-32 called stage are recovered and transferred to surrogate mother cows

Significance:

- This is a technique for breed improvement.
- High milk yielding breed of females and high meat yielding bulls have been mated successfully to increase breed size in a short time.
- This technology has been successfully used for cattle, sheep, rabbit, mares and buffaloes.

12. Define breed. Describe different methods of animal breeding and mention their significance

Answer: Breed is a group of animals related by origin and similar in more characters like general appearance features, size, configuration etc

Methods of animal breeding:

1. Inbreeding: Breeding between the animals of the same breed or closely related animals

Example: cows, buffaloes, poultry

→ It maintains pure lines and increases homozygosity

→ Continued in breeding leads to inbreeding depression which reduces fertility and productivity (Inbreeding depression)

2. Out breeding: Breeding between different breeds or unrelated animals is called out breeding

Significance:

→ It is the best method to overcome inbreeding



→ Best method for animals that are below average in milk production and growth rate in beef, cattle etc

It is of two types

- (a) **Out-crossing:** Mating of animals within the same breed but not having common ancestors on either side up to 4-6 generations is called out crossing
- (b) **Cross-breeding:** Mating of superior males of one breed with superior females of another breed of to get better hybrid variety is called cross - breeding

Example: Hisardale is a new breed of sheep developed in Punjab by crossing Bikaneri ewes and Marino rams

Significance:

→ Many animal breeds have been developed by this approach

→ It allows desirable qualities of different breeds to be combined such are used for commercial purposes

3. **Interspecific hybridisation:** Male and female animals of two different related species are mated

Examples: Mule is cross breed of male donkey and female horse

Significance:

→ Hybrids have desirable features of two parents and have considerable economic value