Chapter 9

Strategies for Enhancement in Food Production

(Assertion Reason Questions)

Directions: In the following questions, a statement of assertion is followed by a statement of reason.
Mark the correct choice as:

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

Q.1. Assertion: The essential methods for livestock production are breeding, weeding, feeding and heeding.
Reason: Livestock management deals with processes and systems that increase yield and improve quality of products.

Q.2. Assertion: Hisardale is new cross breed of sheep.
Reason: It is developed by crossing Bikaneri ewe and Marino ram.

Q.3. Assertion: Light is essential in poultry farm management.
Reason: 14-16 hours of light including day light is required for optimum production of eggs.

Q.4. Assertion: The behaviour of honey bee to come out of the hive in large number is called swarming.
Reason: It relieves the crowding and provides a means of founding new colonies.

Q.5. Assertion: Beehives are kept in crop field during flowering period.
Reason: Bees are pollinating agents.

Q.6. Assertion: The honey bee queen copulates only once in her life time.
Reason: The honey bee queen can lay fertilized as well as unfertilized eggs.

Q.7. Assertion: Fish meal is a rich source of protein for cattle and poultry.
Reason: Fish meal is produced from non-edible parts of fishes like fins, tail etc.

Q.8. Assertion: Cattle breeds can be improved by superovulation and embryo transplantaion.
Reason: Superovulation in high milk-yielding cows is induced by hormonal injection.

Q.9. Assertion: In MOET, hormones with progesterone like activity are given to the cow to induce superovulation.
Reason: After mating, the embryos at 4-6 celled stage are recovered and transferred to surrogate mothers.

Q.10. Assertion: The depth of sowing has an important effect on some pathogens, notably those which attack seedlings.
Reason: By delaying the emergences of seedlings, deep sowing may help to increase the resistance of a susceptible crop to a pathogen.

Q.11. Assertion: Mass selection is useful in homozygous plants.
Reason: Mass selection does not work with cross-pollinated plants.

Q.12. Assertion: In case of vegetatively propagated crops, pure-line selection is not required.
Reason: Hybrid vigour is mostly used in vegetatively propagated plants.

Q.13. Assertion: Use of fertilizers greatly enhances crop productivity.
Reason: Irrigation is very important in increasing crop productivity. [AIIMS 2003]

Q.14. Assertion: Wild varieties of crop plants must be conserved.
Reason: Genome of wild plants serve as important resource for selection of desired genes like genes for pest resistance.

Q.15. Assertion: Removal of male parts is called emasculation.
Reason: Bagging is not required for emasculated flowers.

-x-x-x-

ANSWER KEY

Q.1 : (b) Livestock refers to farm animals (domesticated animals) such as cow, sheep, etc. kept by humans for a commercial purpose. Its management aims to increase yield and improve the quality of products they generate. Four essential methods for livestock improvement are breeding, weeding, feeding and heeding.

(i) Both the male and female animals selected for breeding should be of superior quality.

(ii) Weeding aims that uneconomic animals must be prevented from reproducing.

(iii) Feeding is also very important for animals. Each animal should be fed on a balance diet.

(iv) Heeding implies good animal management and general supervision including housing care and maintenance of proper cleanliness and hygiene.

Q.2 : (a) Hisardale is a new breed of sheep developed in Punjab by crossing Bikaneri ewe and Marino ram. In cross-breeding method, superior males of one breed are mated with superior females of another breed. Crossbreeding allows the desirable qualities of two different breeds to get combined. The progeny may be used for commercial production. Many new animal breeds have been developed by this approach.

Q.3 : (a) Light management is essential for high egg production in poultry birds. 14 to 16 hours of light including daylight is required for optimum production.

Q.4 : (a) Swarming is the process by which a new honey bee colony is formed when the queen bee leaves the colony with a large group of worker bees.

Q.5 : (a) Bees are the pollinators of many crop species such as sunflower, Brassica, apple and pear. Keeping beehives in crop fields during flowering period increases

pollination efficiency and improves the yield which is beneficial for both crop and honey yield.

Q.6 : (b) It is said that the queen gets mated only in her life but in a single chance of mating. After mating the queen lays eggs in one brood cell. The larvae emerge out from both the fertilized as well as unfertilized eggs. Thus, the larvae from the unfertilized eggs form the drones while the worker are developed from the larvae of fertilized eggs.

Q.7 : (c) Fish meal is prepared from the wastes of fish oil or canning industry or from the whole fish of nol-oil-type. Wastes of cod industry are known as white 'fish meal'. The protein content of this meal is highly digestible, nutritive and is of biological importance. This fish meal also contains calcium phospholipids, and iodine, fish meal is also used as major food of domestic animals like pigs, poultry and cattle.

Q.8 : (b) Superovulation is induced by hormone injection. Superovulation and embryo transplantation techniques have been used in India for cattle improvement.

Q.9 : (d) In multiple ovulation embryos transfer technology (MOET), hormones (with FSHlike activity) are given to the cow for inducing follicular maturation and super ovulation. Instead of one egg, they produce 6-8 eggs per cycle. The cow is either mated with a best bull or artificially inseminated. The embryos at 8-32 cell stage are recovered and transferred to surrogate mothers. The genetic mother is available for another superovulation. MOET has been done in cattle, sheep, rabbits, buffaloes, mares, etc.

Q.10 : (a) Sowing practices, such as changing time, depth and direction of sowing, and changing the density of the crop can protect plants from pathogens to which they are susceptible only at certain stages of their development. Changing the time of sowing can exploit weather conditions that are unfavourable to the pathogen, thus reducing crop losses. This might require the use of a specific cultivar that is adapted to the selected growing period, but might also be susceptible to different pathogens. The depth of sowing can have a bearing on the chance of infection, as the seedling's pre-emergence stage, which is usually more susceptible to attack, is longer when seeds are planted deeper. However, deeper planting can stimulate germination.

Q.11 : (b) Mass selection is useful in self pollinated plants since they are usually homozygous and retains the selected traits in the progeny. However, cross pollinated plants are usually heterozygous. Their phenotypic expression is largely

due to their hybrid vigour or heterozygous nature. Mass selection of such plants fails in subsequent generations.

Q.12 : (b) In case of vegetatively propagated crops, pure line selection is not required. Pureline selection is useful only for sexually reproducing plants. Hybrids vigour is most profitably used in vegetatively propagated crops because they do not involve sexual reproduction and hence loss of hybrid superiority.

Q.13 : (b) Irrigation relates to the supply of water to the crops. Fertilizers which are mainly NPK are required to increase the harvest of crops.

Q.14 : (a) Plant breeding involves selection of parents with desired characters, their crossing and selection of hybrid progeny with desired character. Wild varieties of crop plants have better resistance to insects, pests, diseases, etc. During plant breeding these wild varieties serve as germplasm resource where genes for disease resistance, etc., can be searched and selected. The wild varities with desired character can be crossed with crop plants to obtain desired set of characters in the progeny. Therefore, wild varieties of crop plants must be conserved, otherwise large amount of germplasm will be lost.

Q.15 : (c) In case of bisexual flowers, the anthers of the proposed plant are removed before they dehisce. The process is called emasculation. The emasculated flowers are immediately covered by paper or polythene bags by the process called bagging. It prevents unwanted pollen to come in contact with emasculated flowers.