Short Answer Type Questions – I

[2 marks]

Q. 1. Why offsprings differ from parents in certain characters?

Ans. It is due to biparental percentage. The genes on chromosomes which pass over to the next generation is partly derived from both the parents (mother and father). During fertilisation of egg by the sperm, new combination of chromosomes enter the zygote, due to which certain variations occur in the offsprings. Thus, brothers and sisters show variations in their complexion, habits and behaviour.

Q.2. What are the causes of variations?

Ans. Following are the causes of variations:

(i) Dual percentage: Offsprings inherit some features from mother and some from father, hence no offspring will exactly resemble to either of the parent or each other.

(ii) Mutation in gene or chromosomal pattern also causes variations.

Q. 3. Give the pair of contrasting traits of the following characters in pea plant and mention which is dominant and recessive

(i) yellow seed
(ii) round seed

Ans. (i) yellow – dominant
green – recessive

(ii) round – dominant
wrinkled – recessive

Q. 4. What is the contribution of Mendel genetics?

Ans. Mendel observed the occurrence of contrasting character of garden pea in various generations. On this basis, he interpreted that these contrasting characters are controlled by factors. He considered each and every character as a unit, which is controlled by a 'factor'. Factors are carriers of hereditary information. Now, factors are knows as genes.

Q. 5. Do genetic combination of mothers play a significant role in determining the sex of a new born?

Ans. No, because of mothers have a pair of X-chromosomes. All children will inherit an 'X' chromosome from their mother regardless of whether they are boys or girls.

Q. 6. How does use and disuse of an organ help in evolution of a new species?

Ans. According to Lamarck, those organs which are used regularly become strong and more developed. On the other hand, those organs which are not used regularly become weak and degenerate. Such characters are inherited to the offsprings and so on. In the due course of time, such characters become permanent in later generations and become quite different from their ancestors, resulting in the formation of a new species.

Q.7. A very small population of a species faces a greater threat of extinction than a larger population. provide a suitable genetic explanation.

Ans. Fewer individuals in a species impose extensive inbreeding among them. This limits the appearance of variations and puts the species at a disadvantage if there are changes in the environment. Since the individuals fail to cope up with the environmental changes, they may become extinct.

Q. 8. Does the occurrence of diversity of animals on earth suggest their diverse ancestry also? Discuss this point in the light of evolution.

Ans. Though animals have a vast diversity in structures they probably do not have a common ancestry, because common ancestry may greatly limit the extent of diversity. As many of these diverse animals are inhabiting the same habitat, their evolution by geographical isolation and speciation is also not likely. Thus, a common ancestry for all animals is not the likely theory.

Q.9. All the human races like Africans, Asians, Europeans, Americans and others might have evolved from a common ancestor. Provide a few evidences in support of this view.

Ans. All human races have evolved from a common ancestor because everybody has:

(i) Common body design, structure, physiology and metabolism
(ii) Constant chromosome number
(iii) Common genetic blue print
(iv) Freely inter-breeding species.

Q. 10. A change in DNA that is useful for one property to start with, can become useful later for a different function. Explain.

Ans. A change/feature/property of an organism that may have helped it to adopt to an environmental condition can also become useful for a completely different function in the future. For example: feathers in birds, a character developed and selected during natural selection because it provided insulation in cold weather have become useful in later stages for flight.

Some dinosaurs had feathers, but they could not fly. Birds later adapted the feathers to fly.

Q. 11. List two differences in tabular form between dominant trait and recessive traits. What percentage/proportion of the plants in the F_2 generation/progeny were round, in Mendel's cross between round and wrinkled pea plants?

Ans.

Dominant trait	Recessive trait
(i) The trait which appears in the F_1 progeny is dominant.	(i) The trait which remains hidden or which does not appear in the F_1 progeny is the recessive trait.
(ii) It appears in more number.	(ii) It appears in less number.

75% of the plants were with round seeds.

Q. 12. How many pairs of chromosomes are present in human beings? Out of these how many are sex chromosomes? How many types of sex chromosomes are found in human beings.

Ans. 23 pairs of chromosomes are present in human beings. One pair of these are sex chromosomes. Two types of sex chromosomes are there: XX and XY.