WORKSHEET 1

CHAPTER 4 – HEREDITY AND EVOLUTION

A. Tick (✓) the correct option.

1. A basket of vegetable contains carrot, potato, radish and tomato. Which of them represent the correct homologous structures?
   a. Carrot and potato b. Carrot and tomato c. Radish and carrot d. Radish and potato
2. The fossil remains of *Archaeopteryx* is a connecting link between
   a. reptiles and mammals. b. reptiles and birds.
   c. fish and amphibians. d. amphibians and reptiles.
3. Which of the following has been produced from wild cabbage by artificial selection for arrested flower development?
   a. Kohlrabi b. Cabbage c. Broccoli d. Cauliflower
4. The fossil trilobite was originally
   a. an Arthropod. b. an invertebrate. c. a Reptile. d. an Aves.
5. Tallness (T) is dominant over dwarfness (*t*) while red (R) flower is dominant over white flower (*r*). A plant with genotype TtRr is crossed with plant of genotype ttrr. What percentage of progeny have tall plants with red flowers?
   a. 25% b. 50% c. 75% d. 100%

B. Fill in the blanks.

1. The number of X chromosomes in a human ovum is _____
2. The *Origin of Species* was written by _____
3. The number of autosomes in the human zygote is _____
4. The genotype of an individual heterozygous for L is written as _____
5. The dihybrid ratio of 9 : 3 : 3 : 1 proves the law of _____

C. State true (T) or false (F).

1. Gene is the functional segment of DNA.
2. Kohlrabi has been artificially selected from wild for enlarged leaf.
3. More closely are two species related, more distantly they have common ancestors.
4. Acquired traits are inherited.
5. Natural selection helps in diversity with adaptation.

D. Match the following.

1. Fossil	(*a*) a famous evolutionist
2. A theory of evolution	(*b*) survival of the fittest
3. Probable ancestor of birds	(*c*) father of genetics

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4. Charles Darwin
5. Gregor Mendel

(*d*) petrified remains of prehistoric life
(*e*) *Archaeopteryx*

E. Answer the following questions.

1. A Mendelian experiment consisted of breeding round yellow pea seeds with wrinkled green pea seeds. The progeny all bore yellow but half of them are wrinkled. What is the genetic make-up of round yellow parent?
2. Why are acquired traits not inherited?
3. Explain how fossils provide evidence for evolution.
4. The genotype of green stemmed tomato plants is denoted as GG and that of purple stemmed tomato plants as gg. When these two are crossed:
   (*i*) What colour of stem would you expect in F_1 generation?
   (*ii*) Give the percentage of purple stemmed plants if F_1 are self-pollinated.
   (*iii*) In what ratio would you find GG and Gg in F_1 progeny?
5. Does geographical isolation play a role in the speciation of a sexually reproducing organism? Explain.

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ANSWERS

WORKSHEET 1

A. Tick (✓) the correct option.

1. c 2. b 3. c 4. a 5. a

B. Fill in the blanks.

1. One 2. Charles Darwin 3. 44 (22 pairs) 4. Ll
5. Independent Assortment

C. State true (T) or false (F).

1. T 2. F 3. F 4. F 5. T

D. Match the following.

1. (*d*) 2. (*b*) 3. (*e*) 4. (*a*) 5. (*c*)

E. Answer the following questions.

1. YYRr.
2. Acquired traits does not bring any change in the gene of reproductive cells. Hence, they cannot be inherited.
3. Fossils provide evidence of evolution by showing the variation in structures and characteristics of related plants and animal species. Fossils show a progression of evolution and represent the relation between the current alive organisms and their ancestors.

   Radioisotope dates of rock strata demonstrate how plants and animals changed over time.

   Fossils also reveal how the climate of an area changed over a period of time and how plants and animals are adapted to their environment.
4. (*i*) Green
   (*ii*) 25%
   (*iii*) 1 : 2
5. Geographical isolation play a very important role in speciation of sexually reproducing organisms. Due to geographical isolation, like river, the level of gene flow between two sexually reproducing sub-population becomes minimum. Over generation, due to genetic drift and natural selection, which operate differently in the two geographically isolated sub-population, lead to difference in genetic make-up of the two. As a result, over a period of time, the members of sub-population cannot reproduce with each other. There are severe DNA changes and hence the germ cells of the two groups cannot fuse with each other giving rise to two new species.

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