BRAIN INTERNATIONAL SCHOOL

Biology Assignment CLASS: X NOVEMBER -2024

SUBJECT- BIOLOGY

Chapter :8 Heridity

MULTIPLE CHOICE QUESTIONS

1. Which of the following is a totally impossible outcome of Mendel's Experiment?

a. 3 tall 1 short plant

b. 24 tall and 8 short plants

c. 8 tall and 0 short plants

d. 4 tall plants and 1 medium height plant

2. Which of the following is not a direct conclusion that can be drawn from Mendel's Experiment?

a. Only one parental trait is expressed

b. Two copies of each trait is inherited in sexually reproducing organism

c. For recessive trait to be expressed, both copies should be identical

d. Natural selection can alter the frequency of an inherited trait

3. Which one is a possible progeny in F2 generation of pure bred tall plant with round seed and short plant with wrinkled seeds?

a. Tall plant with round seeds

b. Tall plant with wrinkled seeds

c. Short plant with round seed

4. Which section of DNA provides information for one protein?

a. Nucleus

b. Chromosomes

c. Trait

d. Gene

5. What is the probability that the male progeny will be a boy?

a. 50%

b. 56%

c. 47.43%

d. It varies

6. Independent inheritance of two separate traits, shape and colour of seeds in Mendel's cross on pea plants resulted in an observable ratio of:

a. 3 : 1

b. 9 : 3 : 3 : 1

c. 1 : 1

d. 9 : 4 : 2 : 1

7. If a round, green seeded pea plant (RR yy) is crossed with wrinkled, yellow seeded pea plant (rr YY), the seeds produced in F1 generation are:

a. round and yellow

b. round and green

c. wrinkled and green

d. wrinkled and yellow

Assertion-Reason Questions

1. **Assertion(A):** A geneticist crossed two pea plants and got 50% tall and 50% dwarf in the progeny.
   Reason (R) : One plant was heterozygous tall and the other was dwarf.
2. **Assertion(A) :** Variations are seen in offspring produced by sexual reproduction.
   Reason (R) : DNA molecule generated by replication is not exactly identical to original DNA.
3. **Assertion(A) :** Mutation is sudden change in the genetic material.
   Reason (R) : Variation is useful for the survival of species over time.
4. **Assertion(A):** Mendel selected the pea plant for his experiments.
   Reason (R) : Pea plant is cross-pollinating and has unisexual flowers**.**
5. **Assertion(A):** The sex of a child is determined by the mother.
   Reason (R) : Humans have two types of sex chromosomes: XX and XY.

Short Answer Type Questions [2 Marks]

1.Why do asexually reproducing organisms show very little variations?

2. How does the creation of variations in a species promote survival?

3. Why did Mendel select pea plant for his experiments?

4. Explain the result of Mendel's monohybrid cross.

5. If a plant is heterozygous for tallness, the F2 generation has both tall and dwarf plants. Which principle does it prove?

Short Answer Type Questions [3 Marks]

1.What is dihybrid cross? What is the ratio of F2 hybrid?
2. State the ratio of plants produced in the monohybrid cross in the F1 and F2 generation.
3. Where are genes located? What is the chemical nature of genes?

4. How is the sex of a newborn child determined in humans?

Long Answer Type Question [5 Marks]

1. (a) What will you get in the F_1 and F_2 generations in the following cross?
Pure tall pea plant × Pure dwarf pea plant
(b) It it an example of monohybrid cross or dihybrid cross?

2. What do the following symbols used in the topic on heredity represent?
(a) TT
(b) tt
(c) XX
(d) XY

3. (a) If a normal human cell has 46 chromosomes, how many chromosomes will be there in a human (i) sperm cell, and (ii) zygote?
(b) What sizes of plants are produced if both parents have genes Tt?

4. Gregor Mendel's first law of genetics states "Of a pair of contrasted characters, only one can be represented in a gamete by its internal 'factor'.
(a) Give the modern name for this 'factor'.
(b) State where these factors are found in gametes.