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Question 1. If a trait A exists in 10% of a population of an asexually reproducing species and a trait B exists in 60% Of the same population, which trait is likely to have arisen earlier ?
Answer: As species are asexually reproducing, there would be only very minor differences generated due to small inaccuracies in DNA copying, so trait B, which exists in 60% of the same population may get inherited earlier while trait A, which exists in 10% of the population may be originated late due to variations. Thus, trait B have arisen earlier since it is present in 60% of the same population.

Question 2. How does the creation of variations in a species promote survival ?
Answer: Natural selection selects the individuals having useful variations which ensure their survival in the prevailing conditions of environment. Variant individuals that can withstand or cope with prevailing environment will survive better and will increase in number through differential reproduction.

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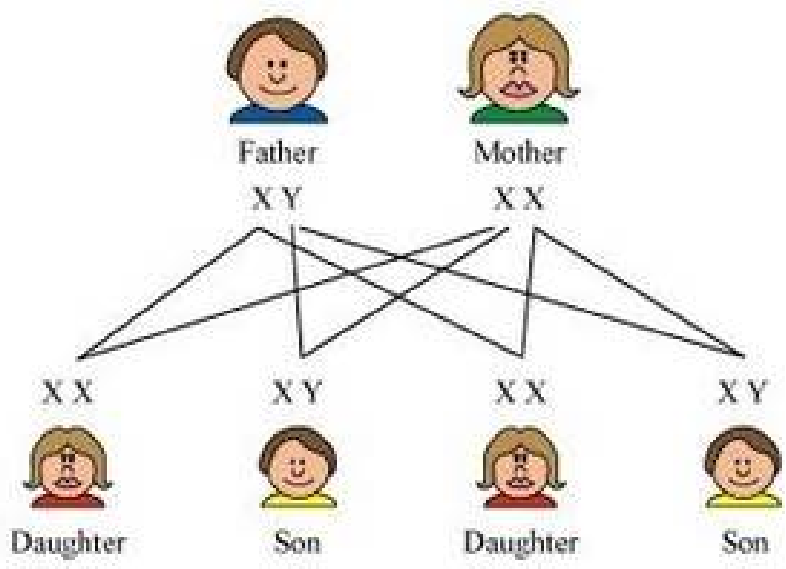
Question 1. How do Mendel's experiments show that traits may be dominant or recessive ?
Answer: Mendel took pea plants with contrasting characteristics — tall plant and dwarf (short) plant. On cross pollination, he got all tall plants in F1 generation. Then by self pollination of F1 tall plants, he produced second generation (F2) consisting of tall and short plants in the ratio of 3 : 1. Then he concluded that, 'T' (tall) trait is dominant while 't' trait for shortness is recessive.

Question 2. How do Mendel's experiments show that traits are inherited independently ?
Answer: In a dihybrid cross made by Mendel, it was observed that when two pairs of traits or characters were considered; each trait expressed independent of the other. Thus, Mendel was able to propose the Law of Independent Assortment which says about independent inheritance of traits.

Question 3. A man with blood group A marries a woman with blood O and their daughter has blood group O. Is this information enough to tell you which of the traits — blood group A or O is dominant ? Why or why not ?

Answer: No. This information is not sufficient to determine which of the traits – blood group A or O – is dominant. This is because we do not know about the blood group of all the progeny.Blood group A can be genotypically AA or AO. Hence, the information is incomplete to draw any such conclusion.

Question 4. How is the sex of the child determined in human beings?



Answer: The females carry two X-chromosomes. Females produce one type of gametes (eggs) with same type of chromosomes (22 + X). Males have one X and one Y- chromosome. Among the male gametes, half of the sperms carry X-chromosome (22 X) and half carry Y-chromosome (22 + Y). Thus, female is homogametic and male is heterogametic. When a sperm carrying X- chromosome fertilises an egg, the zygote develops into female (XX condition). When sperm carrying Y-chromosome fertilises an egg, the zygote develops into a male (XY condition). Thus, sex is determined at the time of fertilisation.

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