Practice Paper

XII

Board/ Sample Paper

1. Given below is a stretch of DNA showing the coding strand of a structural gene of a transcription unit.

5'--ATG ACC GTA TTT TCT GTA GTG CCC GTA CTT CAG GCA TAA—3'

a) Write the corresponding template strand and the mRNA strand that will be transcribed, along with its polarity.

b) If GUA of the transcribed mRNA is an intron, depict the sequence involved in the formation of mRNA /the mature processed hnRNA strand.

i. In a bacterium ii. In humans

c) Upon translation, how many amino acids will the resulting polypeptide have? Justify.

2. In shorthorn cattle, the coat colours red or white are controlled by a single pair of alleles. A calf which receives the allele for red coat from its mother and the allele for white coat from its father is called a 'roan'. It has an equal number of red and white hairs in its coat.

a) Is this an example of codominance or of incomplete dominance?

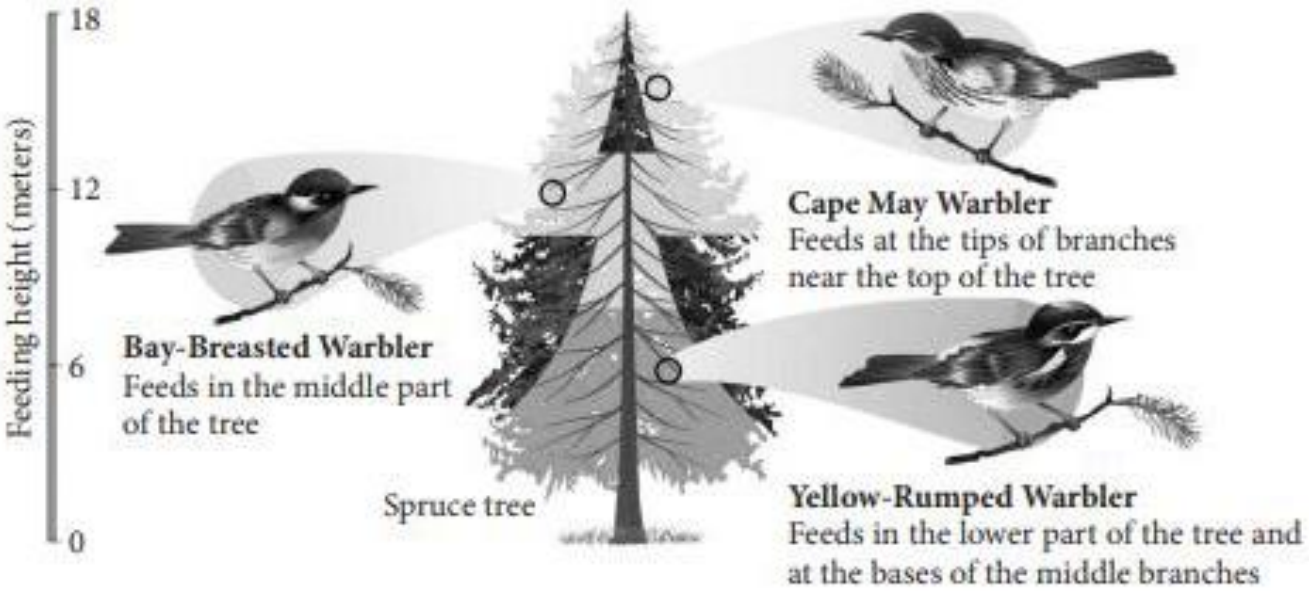
b) Give a reason for your answer. c) With the help of genetic cross explain what will be the consequent phenotype of the calf when i. red is dominant over white ii. red is incompletely dominant.

3. In garden pea, round shape of seeds is dominant over wrinkled shape. A pea plant heterozygous for round shape of seed is selfed and 1600 seeds produced during the cross are subsequently germinated. How many seedlings would have non-parental phenotype?

(a) 1600	**(b) 1200**
(c) 400	**(d) 800**

4. If 'A' represents the dominant gene and 'a' represents its recessive allele, which of the following would be the most likely result in the first generation offspring when Aa is crossed with aa ?
(a) All will exhibit dominant phenotype.
(b) All will exhibit recessive phenotype.
(c) Dominant and recessive phenotypes will be 50% each.
(d) Dominant phenotype will be 75%.

5. Diagram given below depicts different species of Warbler birds feeding on different regions on a Spruce tree. Explain the mechanism which helps them to co-exist.



6. Assuming that within a population of beetles where Hardy Weinberg conditions are met, the colour black (B) is dominant over the colour red (b). 40% of all beetles are red (bb).
Given this information, answer the questions below:
A. What is the frequency of red beetles? (1)
B. Calculate is the percentage of beetles in the population that are heterozygous. (2)
7. A woman with blood group O married a man with AB group. Show the possible blood groups of the progeny. List the alleles involved in this inheritance. (C.B.S.E. 2008)

8. Name any two vertebrate body parts that are homologous to human fore-limbs (C.B.S.E. 2008)