Chapter 10 Molecular Genetics III

(book edition 2009)

10.1

II/2 is dominant homozygote, II/3 is a heterozygote.

10.2

In this case, the analyses did not provide information about the of the II/2 and II/3. The analysis was not informative.

10.3

II/3 is a carrier

10.4

II/3 is a carrier (tasks 10.3 and 10.4 are unfortunately identical)
Alternative question:
Which results of DNA analysis should be obtained to provide the evidence that the daughter II/3 is not carrier?
The affected son II/1 should have the allele 1 from the mother. His healthy brother II/2 should have the maternal allele 2. The daughter II/3 will have still the alleles 1 and 2, but the interpretation of her genotype will now be different: She inherited the allele 1 from her healthy father and allele 2 from her mother (who is carrier). Now the allele 2 is not associated with the mutant gene because the same maternal allele 2 is present in her healthy brother)

10.5

a. 50% for every (each) child, AD disease
b. II/3 has the probability to be affected 95%., II/4 has the probability to be affected 5%.

10.6

a. 50% for every (each) child, AD disease
b. III/1 has the probability to be affected 95%. The child shares the allele D with her affected father and grandfather.) III/2 has the probability to be affected 5% (due to a recombination event, the disease-associated allele in this part of family is the maternal allele B (affected mother II/4). The child II/2 inherited maternal allele A.