GENETICS TRIAL QUESTIONS

1 hour

1. A certain gene affects the body color of an individual but also affects its eye colour. This gene is described as being
   A. Epistatic
   B. Hypostatic
   C. Pleiotropic
   D. Lethal
2. The chances of two normal appearing parents producing an albino child are:
   A. 100%
   B. 50%
   C. 75%
   D. 25%
3. Mendel's factors of inheritance are modernly called
   A. Alleles
   B. Loci
   C. Breeding lines
   D. Crosses
4. Under which of the following conditions will Mendel's laws of inheritance apply?
   A. Complete dominance
   B. Mutations
   C. Linkage
   D. Crossing over
5. Which of the following conditions are inherited in the same way?
   A. Body colour in humans and sickle cell disease
   B. Downs syndrome and shape of ear lobes
   C. Cystic fibrosis and albinism
   D. Hemophilia and eye colour in humans
6. Which on of the following is the smallest?
   A. Chromatid
   B. Allele
   C. DNA molecule
   D. Chromosome
7. A cell in the process of meiosis was seen to have a spindle with sister chromatids being drawn towards opposite poles of the cell. In what stage of meiosis was the cell?
   A. anaphase I
   B. anaphase II
   C. metaphase I
   D. metaphase II
8. A man has haemophilia. Which statement correctly describes the inheritance of the gene causing his condition?
   A. He inherited the recessive allele from his mother.
   B. He inherited the dominant allele from his father.
   C. He can pass the recessive allele to a son.
   D. He can pass the dominant allele to a daughter.
9. Which of the following can introduce new Alleles in a population?
   A. Crossing over
   B. Mutation
   C. Independent assortment
   D. Sexual reproduction
10. A man heterozygous for blood group A is married to a woman of blood group O. Which of these are the blood groups of their children?
    A. Group A and B
    B. Group AB and O
    C. Group A and O
    D. Group A

11. In fruit flies, eye colour is sex linked. In a genetics experiment, a red eyed male was crossed with a white eyed female, and the offspring were a mixture of red eyed females and white eyed male flies.

a) Identify which of the two alleles of eye colour is dominant. (01 mark)

……

b) Use appropriate genetic symbols to determine the phenotypic ratio of the offspring from this experiment. (05marks)

……

……

……

……

……

……

c) State how sex linkage affects the inheritance of a genetic characteristic (03 marks)

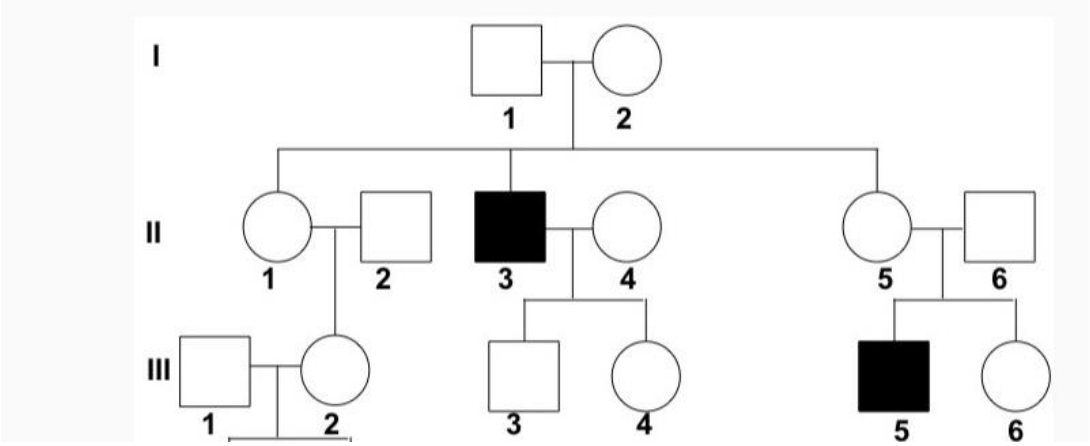
……

……

……

……

12. The illustration below shows inheritance of albinism in a given family over 3 generations I, II and III.



Using A to represent the normal allele and a the albinism allele,

a) Write down the genotypes of individuals 3, 4 and 5 in generation II (03 marks)

……

……

b) Workout the probability that individual 1 in generation II is heterozygous. (02 marks)

……

……

c) List down three features of an albino person (03 marks)

……

……

……

……

d) Explain why albinism cannot be completely wiped out of the population despite the disadvantageous features listed above. (04 marks)

……

……

……

……

……

……

13. Down's syndrome is as a result of a chromosomal Mutation.

a) What is meant by chromosomal Mutation? (01 mark)

……

……

b) State three effects of Mutations to organisms (03 marks)

……

……

……

……

……

c) Explain how Down's syndrome arises. (03 marks)

……

……

……

……

d) Give 2 reasons why genetic disorders such as colour blindness are more common than Downs syndrome. (02 marks)

……

……

……

……

14. Flower colour in sweet peas is determined by two genes (R/r and S/s) which are not linked. If atleast one dominant allele from each gene is present, the flowers are purple. All other genotypes are white.

a) Identify the gene interaction above (01 mark)

……

b) Workout the phenotypic ratio in a cross between a plant with genotype RrSs and another with genotype RRSs. (08 marks)

……

……

……

……

……

……

……

……

……

c) List down any 2 other gene interactions (01 mark)

……

……

END