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WORKSHEET

Life Science 12

Week 5

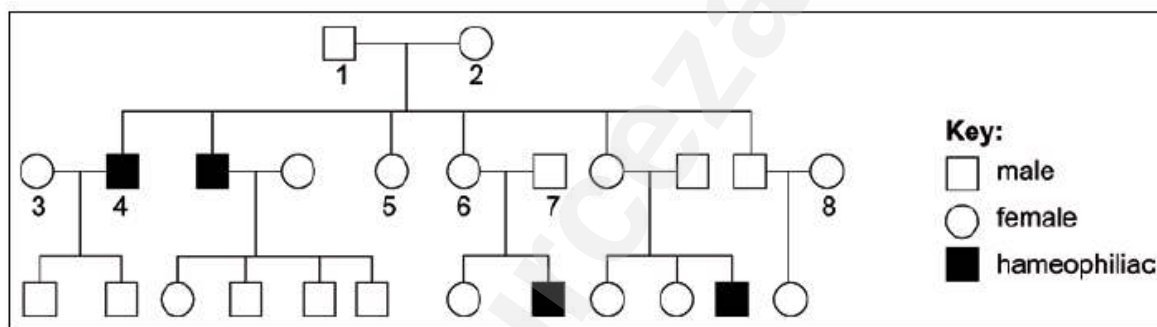
Once your work has been uploaded, I will choose a few questions at random, and it will be for marks.

Lesson 1

{Adapted from: IEB Life Science Supplementary Paper 1, 2017}

Question 4 [9]

Haemophilia A is a genetic disorder caused by a mutation in the gene coding for a blood-clotting factor known as Factor VIII. The mutation is located on the X-chromosome. Factor VIII is a type of protein that is absent in the blood plasma of people with Haemophilia A. Study the family pedigree below and answer the questions that follow:



4.1 Copy and Complete the table below:

Number of the individual	Genotype
8	$X^H X^H$
4	
6	
7	

(3)

4.2 By means of a genetic diagram, show how individuals 1 and 2, neither of whom are haemophiliacs, have had two haemophiliac sons. Include the following in your answer:

- parental genotypes;
- a genetic cross or Punnett diagram; and
- the ratio of the possible genotypes and phenotypes of the offspring.

(6)

WORKSHEET

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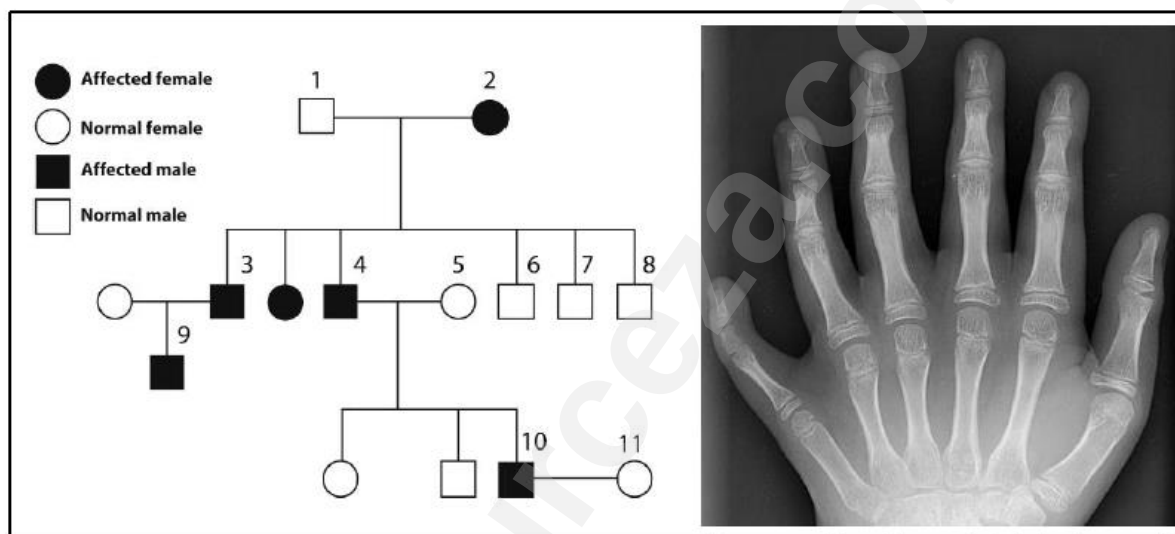
Lesson 2

{Adapted from: IEB Life Science Paper 1, 2017}

Question 5 [17]

Polydactyly is a medical term used to describe extra fingers on the hands and toes on the feet. It is caused by an **autosomal dominant** gene mutation.

Study the family pedigree below and answer the questions that follow:



[Source: <<http://www.brighthub.com/>>]

- (a) Provide a key to express the alleles for normal condition and Polydactyly. (1)
 (b) What is the genotype of the following individuals? Copy the following table. (3)

Individual	Genotype
1	
2	
4	

- (c) What is the gender and phenotype of the following individuals? Copy the table below. (4)

WORKSHEET
Life Science 12
Week 5

Individual	Gender	Phenotype
3		
5		

(d) Explain what is meant by the term "Autosomal dominant gene mutation". (2)

(e) Draw a genetic diagram to show the probability that individuals 10 and 11 will have a child with Polydactyly. Use the key chosen in Question 1 (a).

Include the following in your answer:

- ☐ parental genotypes,
- ☐ a genetic cross or Punnet diagram,
- ☐ the ratio of the possible genotypes and phenotypes of the offspring. (7)

[Total: 26 Marks]