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(b) Rhythmical tapping of the chest wall during physiotherapy can relieve the symptoms of cystic fibrosis in the lungs.

Suggest an explanation for this.

(2)

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(Total for Question = 8 marks)

Q2.

Cystic fibrosis is an inherited condition.

Explain why people with cystic fibrosis can have breathing difficulties.

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Q3.

The photograph below shows a cleft iris, a rare condition in humans. Cleft iris may be due to the inheritance of recessive alleles.



Magnification $\times 1$

Explain the meaning of the term **recessive allele**.

(3)

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Q5.

Leptin is a protein hormone with a role in the control of appetite in humans.

Several mutations of the leptin gene have been identified. All these mutations are frameshift mutations that result in shortened primary structures.

A frameshift mutation involves the insertion or removal of one or two nucleotides from a gene.

Describe how a frameshift mutation could result in the production of leptin with a variety of shorter primary structures.

(2)

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(Total for question = 2 marks)