

Part 1 : Answer the following questions.

Essential elements for life :

✓ Complete the sentences below :

Carbon atoms can form four _____ bonds.

Carbon compounds which life is based on are; _____ ,
_____ , _____ , _____

Metabolism is _____

Anabolism is _____

Catabolism is _____

The most common **Elements** found in living things are:

_____ , _____ , _____ , _____

Other elements & their functions are;

Sulfur - _____

Calcium - _____

Iron - _____

Phosphorous _____

Water :

✓ Complete the following :

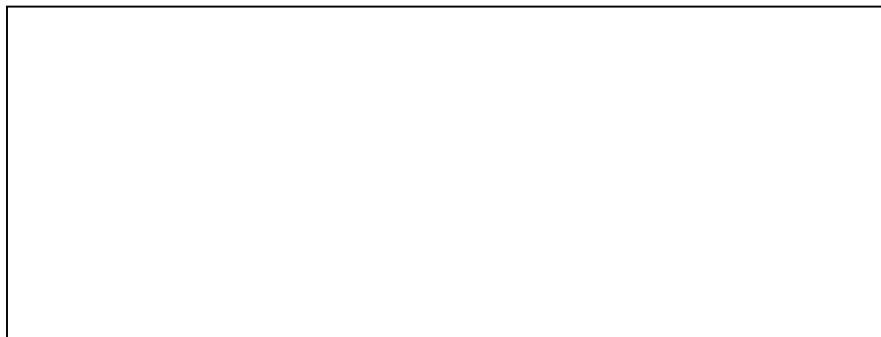
Properties of **Water:**

- _____
- _____
- _____
- _____

The importance of water for living things

- _____
- _____
- _____
- _____

✓ Draw 2 water molecules in the box below : (Label the hydrogen bonds and the polar covalent bonds)



✓ Describe how hydrogen bonding is important in water.

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Carbohydrates

✓ Draw a glucose molecule in the box below :

Lipids

✓ Refer back to the diagram of fatty acids to complete the following sentences :

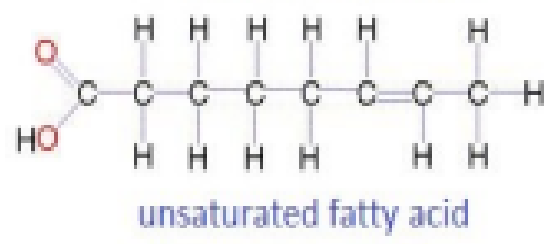
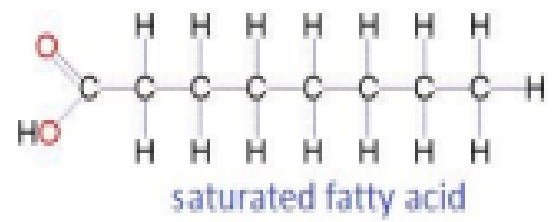
Fatty acids can be saturated, which means

or monounsaturated that means

or polyunsaturated.

A cis isomer of a fatty acid is.

Diagrams of fatty acids



- ✓ Discuss the reasons why lipids are important as long-term energy storage in animals.

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Part 2 : Circle the correct answer

1. Carbon is the basis of biological polymers because

- I It can form chains by bonding to other carbon atoms
- II It is found in carbohydrates
- III It can form four covalent bonds

- A I only
- B I and II only
- C I and III only
- D I, II and III

2. Hydrogen bonding between water molecules is important in living systems because

- I It makes water cohesive
- II It gives water a high specific heat capacity
- III It makes water transparent
- IV It helps water to be a good solvent for polar molecules

- A I and III only
- B II and IV only
- C I and II only
- D I, II and IV only

3. Which of the following processes could be described as anabolism?

- A. The production of amino acids by the action of enzymes on polypeptides.
- B. The production of a large DNA molecule from nucleotide monomers
- C. The conversion of glucose into pyruvate in glycolysis.
- D. The digestion of starch into maltose in digestion.

4. Which row of the table shows a correct description of the different types of fatty acid?

	Saturated fatty acid	Mono-unsaturated fatty acid	Poly unsaturated fatty acid
A	Many double bonds between carbon atoms	One double bond between the carbon atoms	All the carbon atoms are linked by single bonds
B	One double bond between the carbon atoms	Many double bonds between carbon atoms	Many single bonds between carbon atoms
C	All the carbon atoms are linked by single bonds	One double bond between the carbon atoms	Many double bonds between carbon atoms
D	All the carbon atoms are joined by double bonds	One single bond between carbon atoms	Many double bonds between carbon atoms

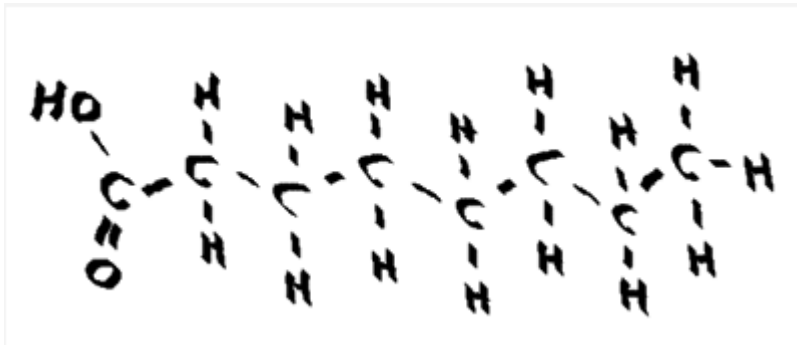
5. What is meant by cell metabolism?

- A. The breakdown of glucose through enzymes catalysed reactions of respiration.
- B. The enzyme catalysed reactions which control of vitamins and minerals in the cell.
- C. All of the enzyme catalysed reactions which take place in the cell.
- D. The production of proteins by a chain of enzyme catalysed reactions.

6. Which of the following correctly identifies the monomers which make a triglyceride molecule when combined.

- A. Monomers = Fatty acid and three glycerol molecules.
- B. Monomers = Glycerol, three fatty acids.
- C. Monomers = Glycerol, three monosaccharides.
- D. Monomers = Glucose, Fructose and galactose.

7. What type of molecule is shown in the diagram below?



- A. A fatty acid
- B. A steroid
- C. A glycerol
- D. An amino acid

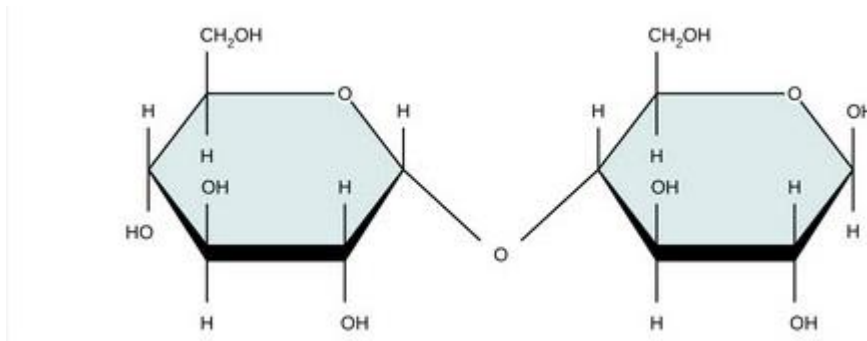
8. To test for a reducing sugar which of the following points best describes the procedure?

- A. Benedict's reagent is heated for two minutes and if the reducing sugar is present it turns orange/red.
- B. Iodine is heated and turns orange/red if a reducing sugar is present.
- C. Biuret reagent turns red if a reducing sugar is present.
- D. Benedict's reagent is heated and if a reducing sugar is present it turns blue/black.

9. How are carbohydrate monomers, like glucose, linked together and what type of molecules do they form?

- A. They are linked by condensation reactions and form ester bonds .
- B. They are linked by condensation reactions and form disaccharides and polysaccharides.
- C. They are linked by peptide bonds and form disaccharides and polysaccharides.
- D. They are linked by hydrolysis reactions and form disaccharides and polysaccharides.

10. The image below shows a molecule commonly found in the human digestive system



What type of molecule is this?

- A. A nucleotide base
- B. A disaccharide
- C. A di-glyceride
- D. A di-peptide

11. What are the two polymers which make up starch called, and what is the difference in their structure?

- A. cellulose, an unbranched molecule and amylose, a branched polysaccharide.
- B. Amylose, an unbranched molecule and amylopectin, a branched polysaccharide.

- C. Amylose, a branched molecule and amylopectin, an unbranched polysaccharide.
- D. Amylose, an unbranched molecule and amylose, a branched polysaccharide.

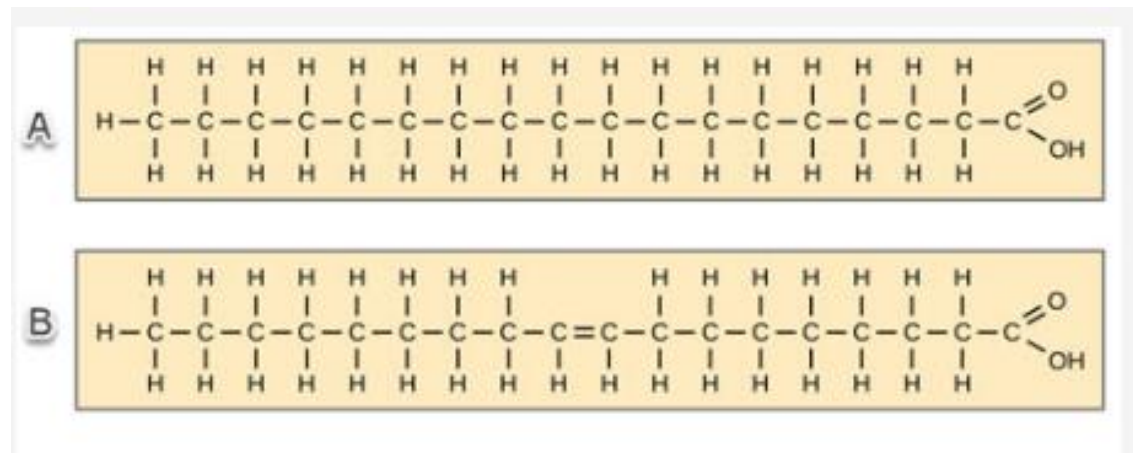
12. Which property of water makes it more useful as a coolant in sweating?

- A. It is adhesive and cohesive.
- B. It has a high latent heat of vaporization
- C. It is transparent.
- D. It has a high melting point.

13. Plant cell walls contain which of the following in abundance?

- A. Lactose
- B. Cellulose
- C. Starch
- D. Glycogen

14. The molecules below are both of the same type, fatty acids.



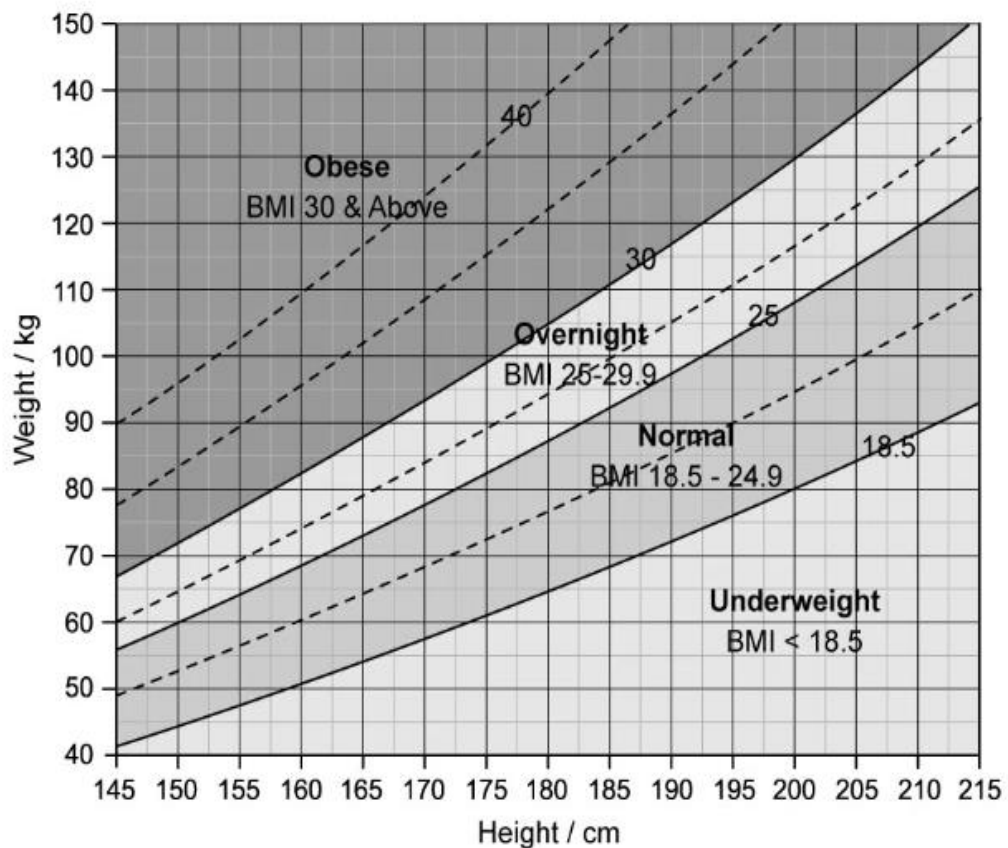
Which of the descriptions of their details is correct.

- A. A is monounsaturated fatty acid and B is an unsaturated fatty acid.
- B. A is a saturated fatty acid and B is a polyunsaturated fatty acid.
- C. A is a trans-fatty acid and B is a cis-fatty acid.
- D. A is a saturated fatty acid and B is a monounsaturated fatty acid.

Nomogram

Q1

The nomogram below shows the range and classification of body mass index (BMI) values.



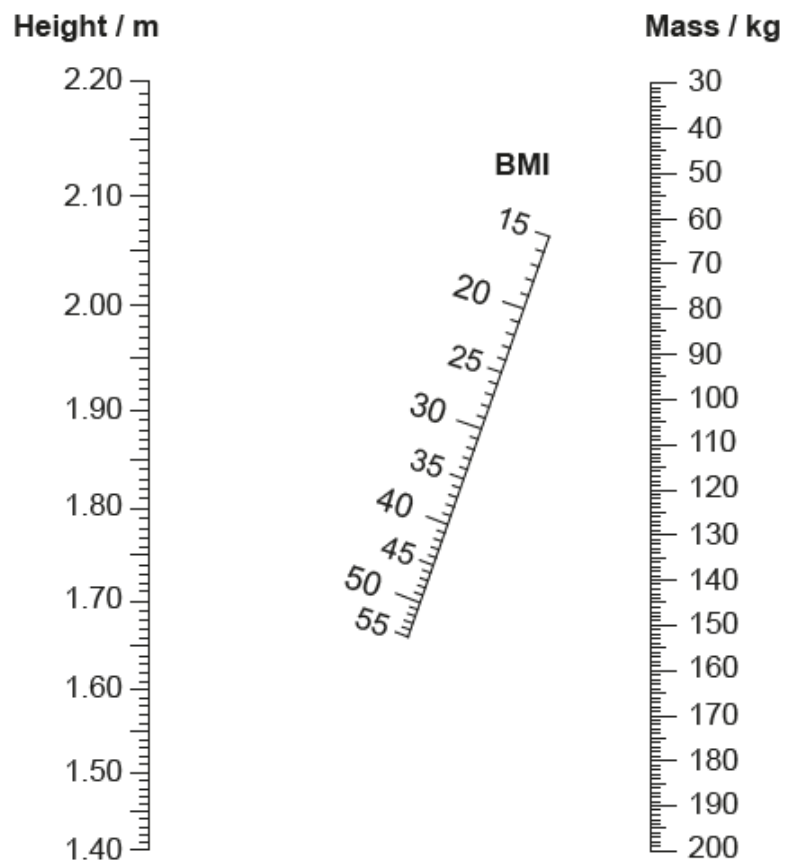
A person of height 170 cm has a mass of 105 kg.

What is the amount of mass this person would have to lose to reach a body mass index within the normal BMI range?

- A.** 15 kg
- B.** 25 kg
- C.** 35 kg
- D.** 50 kg

Q2

A nomogram can be used to determine the body mass index (BMI) of an individual.



State the BMI of a person of mass 80 kg and 1.80 m in height.

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