The National
Orthodox School
Shmaisani

Answer Key.
(2nd month exam)

Name : .....

November 21, 2022

IBDP Grade 9

Duration 1 hour

Exam Instructions:

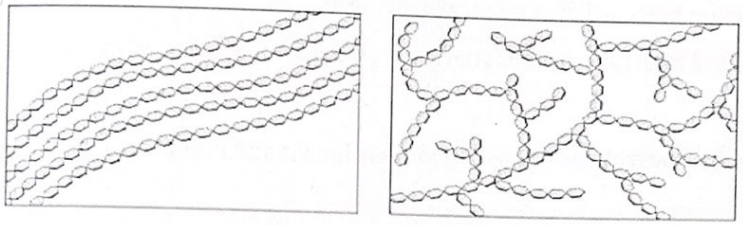
- Answers should be written on lined paper skipping every other line
- Exam Duration includes 5 minutes for reading
- Total Marks for this exam is 35 marks
- All Answers should be written in pen
- No sharing of supplies
- NO QUESTIONS ARE ALLOWED!!
- GOOD LUCK!!!!

Question 1 :

(10 marks)

Circle the correct answer

1. **The diagrams show how monosaccharide molecules are joined to form chains in two polysaccharides.**

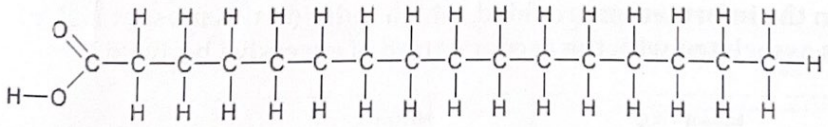


P Q

Using the diagram and the table, which diagram and monosaccharide represent glycogen?

	Diagram	Monosaccharide that makes up the chain
A.	P	glucose
B.	P	maltose
C.	Q	glucose
D.	Q	maltose

2. **Which molecule is depicted in the diagram?**



A. A saturated fatty acid

B. An unsaturated fatty acid

C. A trans fat

D. A vegetable oil

3. **What distinguishes cellulose from glycogen and starch?**

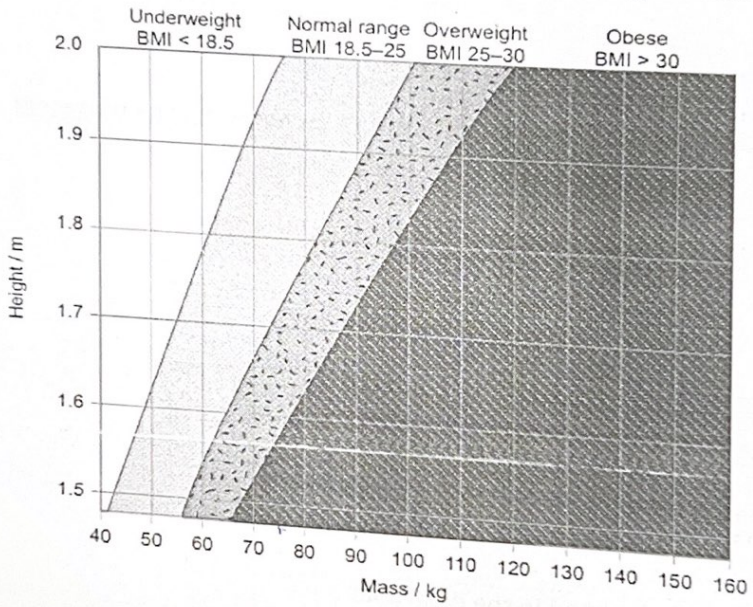
A. Only cellulose is found in plants.

B. Only cellulose is made up of glucose monomers.

C. Cellulose is far more branched than starch and glycogen.

D. Cellulose has a structural role whereas starch and glycogen function in energy storage.

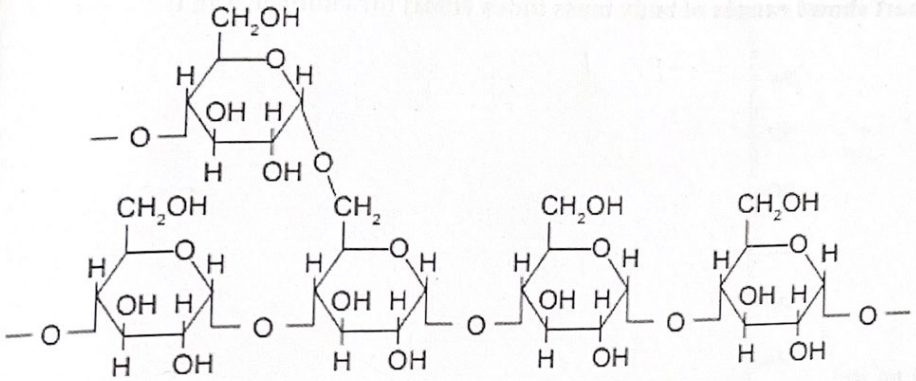
4. **The chart classifies individuals according to their height and mass.**



Based on the information provided, which individual is most at risk of diseases associated with the accumulation of excessive body fat?

	Mass / kg	Height / m
A.	95	1.95
B.	60	1.55
C.	75	1.50
D.	80	1.70

5. The diagram shows part of a molecule.



What is the molecule?

A. Amylose

B. Cellulose

C. Collagen

D. Amylopectin

6. The table shows the mass of different types of fat in some foods.

	Mass per 100 g food			
Food	Saturated fat	Polyunsaturated fat	Monounsaturated fat	Trans fat
Palm oil	50	9	23	0
Canola oil	7	28	63	0
Sunflower oil	10	40	45	0
Partially hydrogenated soybean oil	30	10	15	45

Which oil would be least recommended for inclusion in the human diet?

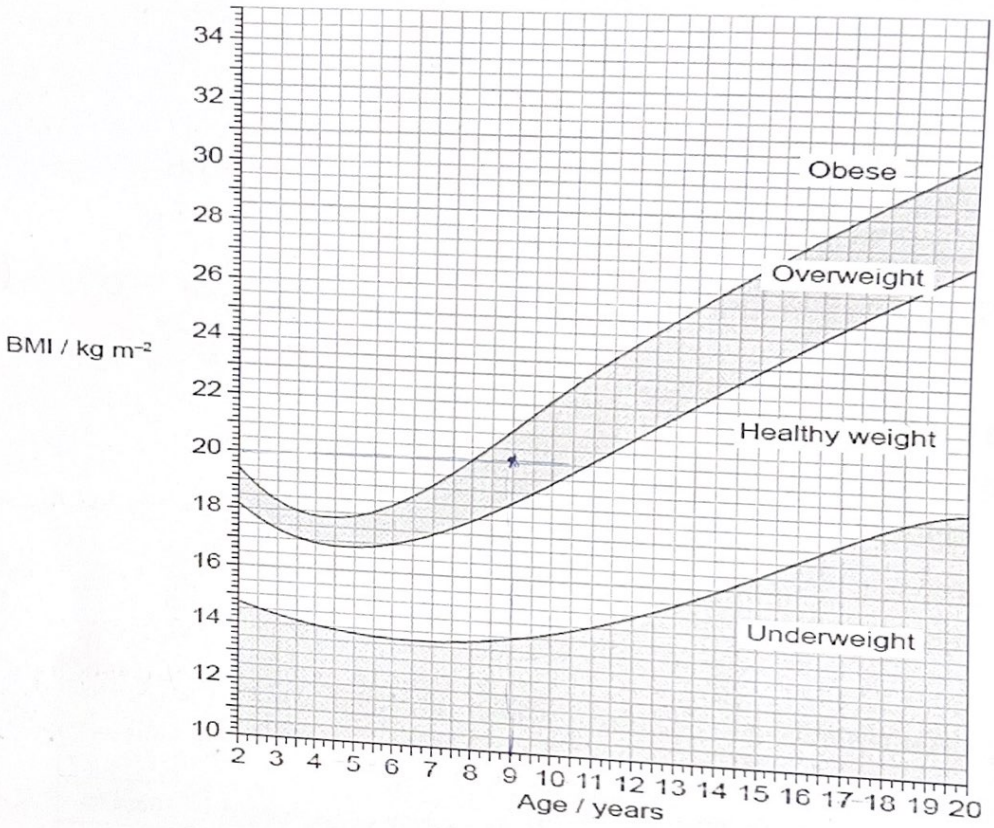
A. Palm oil

B. Canola oil

C. Sunflower oil

D. Partially hydrogenated soybean oil

7. The chart shows ranges of body mass index (BMI) for children and teenagers.



A 9-year-old boy has a height of 120 cm and weighs 28.8 kg. What weight category is he in according to his BMI?

A. Underweight

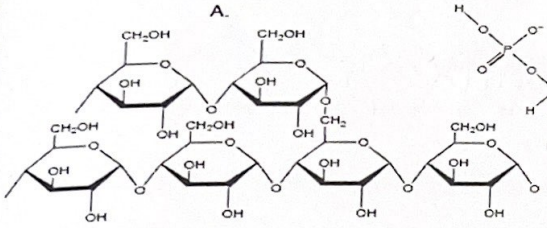
B. Healthy

C. Overweight

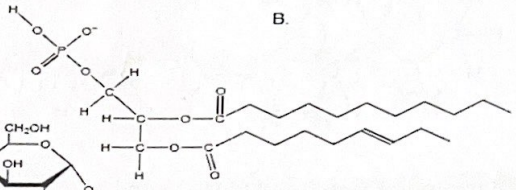
D. Obese

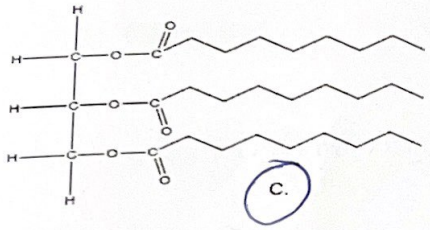
8. Which of the molecules shown would be most suitable for long-term energy storage in humans?

A.

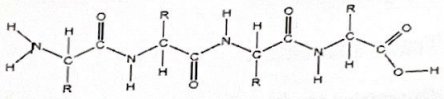


B.





C.



D.

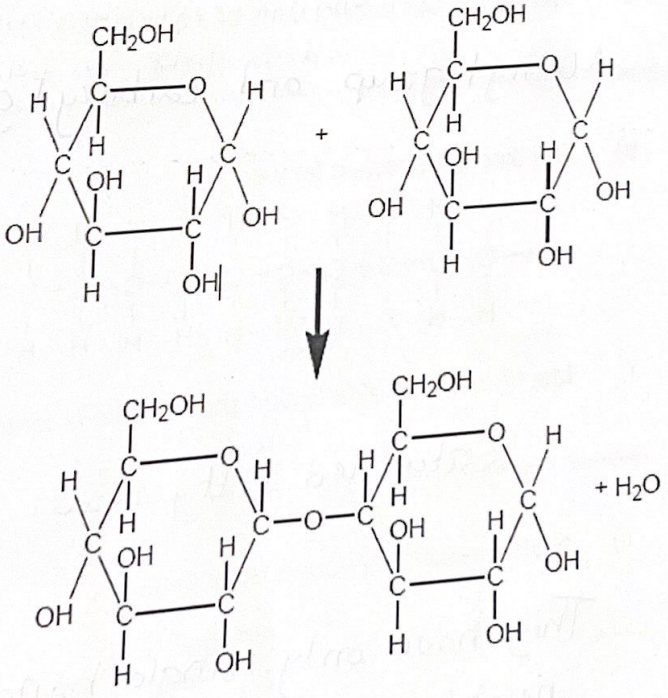
9. What type of molecule is formed by the chemical reaction shown in the diagram?

A. Dipeptide

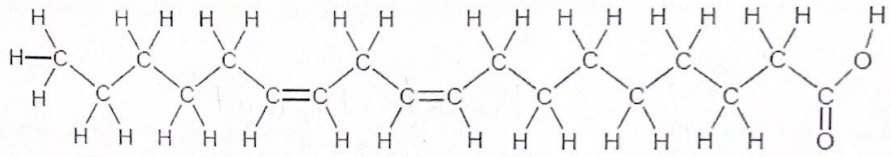
B. Disaccharide

C. Diglyceride

D. Cellulose



10. The diagram shows a type of fatty acid.



What type of fatty acid is shown?

A. Trans unsaturated

B. Cis unsaturated

C. Trans saturated

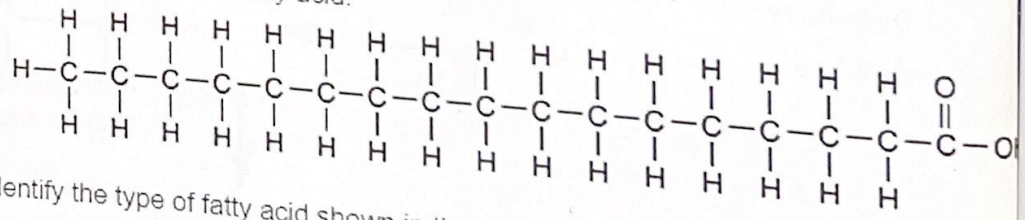
D. Cis saturated

Question 2 :

a) Identify the two distinct parts of a typical fatty acid molecule.

Methyl group and carboxyl group [1]

b) The diagram shows a fatty acid.



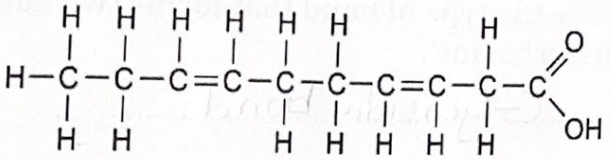
i) Identify the type of fatty acid shown in the diagram.

Saturated fatty acid. [1]

ii) State a reason for your answer in part i).

They have only single bonds between neighboring carbon atoms in the hydrocarbon chain. [1]

c) The diagram shows a different fatty acid.



Use a tick (✓) in each table to identify words to describe the structure of the fatty acid shown.

Monounsaturated	Polyunsaturated	Saturated
	✓	

All Cis	All Trans	Mixture of Cis- and Trans-
✓		

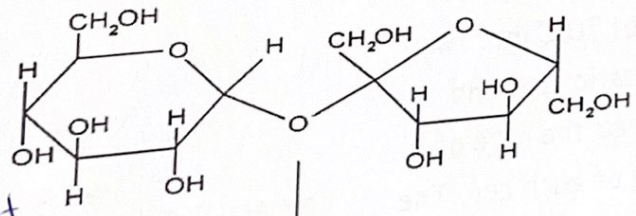
[2]

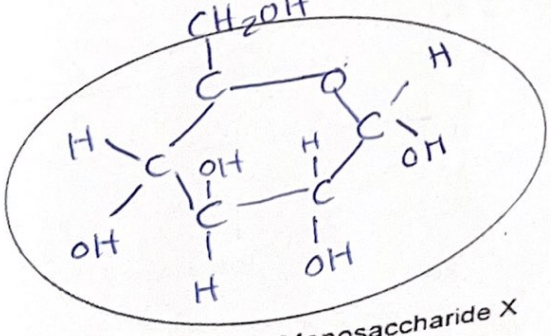
Question 3 :

a) Sucrose is formed from monosaccharides X and Y.
The diagram below shows the structure of sucrose and monosaccharide Y.

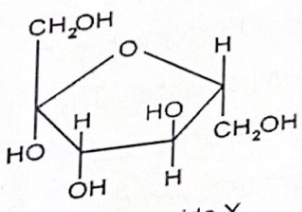
Figure 1

Sucrose





Monosaccharide X



Monosaccharide Y

Glucose.

- **Draw and identify monosaccharide X** [2]
- **State the type of bond that forms two sugar molecules in a disaccharide .**

Glycosidic bond [1]

Question 4 :

Two of the properties of water are its **cohesive** and **adhesive** forces.

Describe how these properties are useful to living organisms.

(1) Cohesion : Hydrogen bonds hold water molecules together

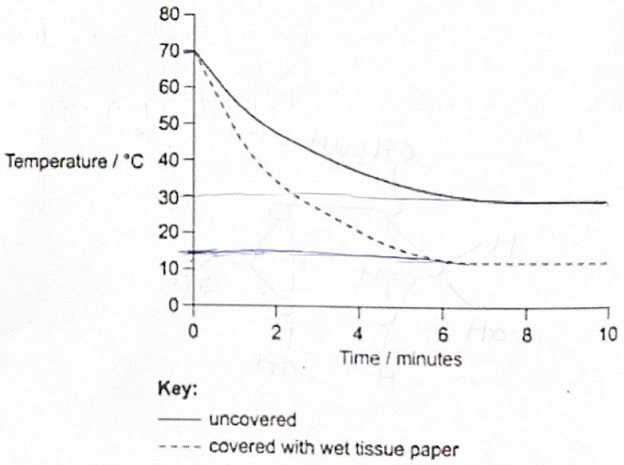
Adhesion : water molecules are attracted to other molecul

(2) water travels in continuous columns (Stem of plants) [3]

(3) It can be held up in xylem of plant.

Question 5 :

A group of students investigated the thermal properties of water. To do this, they poured hot water at 70°C into two thin plastic cups and measured the rate of cooling of each cup. The sides of one cup were covered with tissue paper soaked in hot water. The sides of the other cup were left uncovered.



The temperature of the water in each cup was recorded with a thermometer every 2 minutes for 10 minutes. The results are shown in the graph.

- Other than the starting temperature of the water (70°C), give two conditions that must be kept the same for each cup throughout the experiment.

1. amount of water (volume).
2. Time [2]

- Calculate the change in temperature in each cup after 10 minutes.

Uncovered: 70 - 30 = 40°C

Covered with wet tissue paper: 70 - 14 = 56°C [2]

- Explain, with reference to the thermal properties of water, how this experiment helps demonstrate how humans respond to overheating.

Water has a high specific heat capacity. it can absorb or give out a great deal of heat energy without its temperature changing very much. So it can keep an organism temperature fairly constant. Water acts as a coolant [3]

Question 6 :

(a) A lab was asked to test an unknown food sample to determine which substances were present in the food.

They carried out some simple tests using chemical reagents, **Figure 5** shows the results.

Reagent used in test	Resulting colour
Benedict's solution	Red
Iodine solution	Yellow/orange

Figure 5

(i) The lab concluded that the food sample most likely contained a simple carbohydrate like glucose or fructose.
Explain why the lab came to this conclusion.

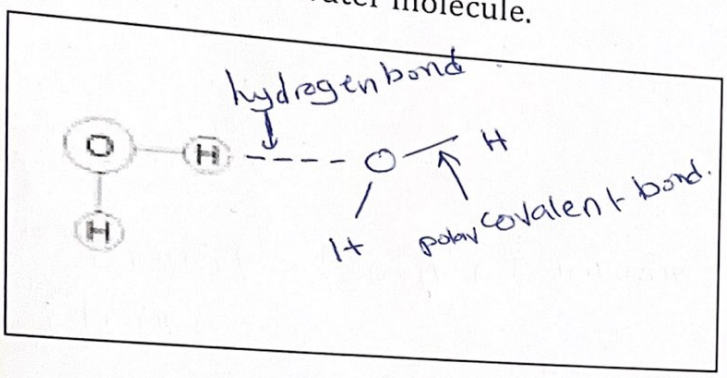
Because the resulting colour of benedict's solution is Red. [1]

(ii) The lab also tested for the presence of fats in the food.
Suggest a simple chemical test they could have carried out.

using ethanol to test for fat a white cloudy layer is formed. [1]

Question 7 :

The figure represents a water molecule.



Draw a second water molecule to show how bonds can form between water molecules.

- Label the hydrogen bond .
- Label the polar covalent bond [3]

Question 8 :

Distinguish between anabolic and catabolic reactions

Anabolism : The synthesis of complex molecules from simpler molecules including the formation of macromolecules from monomers [2]

Catabolism : The breakdown of complex molecules into simpler molecules including the breakdown of macromolecules into monomers.

Good luck