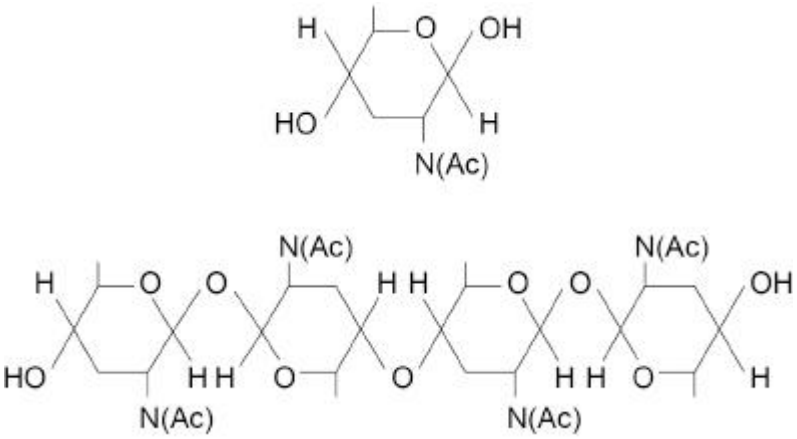
Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Q1.

(a) Chitin is a polysaccharide. The chitin monomer is a β-glucose molecule with one OH group replaced by an $NHCOCH_3$ group. $NHCOCH_3$ can be represented by N(Ac).

The figure below shows the monomer that forms chitin and the chitin polymer.



Chitin has a similar structure to cellulose.

Use the figure above to describe **three** ways the structure of chitin is similar to the structure of cellulose.

1 _____

_____

_____

2 _____

_____

_____

3 _____

_____

_____

(3)

(b) Chitin keeps the tracheae open in the tracheal system of gas exchange in an insect. Gas exchange does **not** occur in the tracheae.

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Explain the importance of **one** adaptation of the gas exchange surface in the tracheal system of an insect.

(2)

(c) Lignin is a polymer found in the walls of xylem vessels in plants. Lignin keeps the xylem vessel open as a continuous tube.

Explain the importance of the xylem being kept open as a continuous tube.

(3)

(Total 8 marks)

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Q2.

(a) Outline the similarities in, and the differences between, the structures of DNA and RNA molecules.

(6)

(b) Outline the similarities in, and the differences between, the structures of chloroplasts and mitochondria.

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_____

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_____

(4)

(Total 10 marks)

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