Welcome to this E learning session.

Today we're going to cover a module

from the paper microbiology and

biochemistry one paper code MC one.

The module that we are going to

cover is from Unit 6 macromolecules,

entitled carbohydrates.

Under this, we will cover

disaccharides that is maltose,

lactose and sucrose,

and reducing and nonreducing sugars.

This is the outline of the module

that we are going to cover today.

We are going to cover disaccharides,

that is maltose,

lactose and sucrose and reducing

and nonreducing sugars at the

end of this module the students

will be able to understand the

term disaccharide elucidate the

structure of various disaccharides,

and explain the concept of reducing and

nonreducing sugars before we move on,

we need to understand the term

disaccharide so disaccharide.

Is a term used when two

monosaccharides are joined together

by acetal or glycoside formation,

that is, by glycosidic linkage.

The Hemiacetal OH of 1 monosaccharide and the

oaks of the second monosaccharide dehydrate.

And because of the dehydration

or the condensation reaction,

a glycosidic bond is formed

between two monosaccharides,

the glycosidic bond.

Is formed between the North Merrick

Carbon and the alkoxy oxygen

disaccharides when they are broken down.

They yield 2 molecules of monosaccharides

on hydrolysis and because of the

formation of a glycosidic bond

between two monosaccharides,

one water molecule is given out.

This is the structure of maltose.

Maltose is a disaccharide which

is made up of two glucose units.

That is 2A D glucose units.

As we can see,

there is a glycosidic bond formed

between the first carbon group present

on the first carbon atom and the H

group present on the 4th carbon atom.

That because of the condensation reaction,

a glycosidic bond is formed,

and this glycosidic bond is

denoted as A14 glycosidic linkage.

Next is lactose.

Lactose is a disaccharide and it is

made up of two monosaccharides that is

beta D galactose and beta D glucose.

Now if we see here in case of lactose

the bond that is formed is beta

14 glycosidic linkage whereas in

case of maltose the bond that was

formed was A14 glycosidic linkage.

So there is a difference in

the glycosidic bond.

That was formed in maltose

and in lactose in lactose.

It is the beta 14 glycosidic linkage.

Next is sucrose.

Sucrose is a disaccharide which

yields 2 monosaccharides.

Upon hydrolysis.

That is,

it yields alpha D glucose and beta D

fructose glucose is A6 carbon structure

whereas fructose is A5 carbon structure 5.

Carbon ring structure and the bond

that is formed between glucose and

fructose is A12 beta glycosidic linkage.

Because the bond is formed between the OH

group of the first carbon atom of glucose.

And the age group of the second

carbon atom of fructose.

So the bond is A12 beta glycosidic linkage.

This is just to summarize,

in sucrose it is made up

of glucose and fructose,

that is alpha D,

glucose and beta D fructose.

So the bond is A12 beta linkage and

the physiological role of sucrose.

It is a product of photosynthesis.

Lactose, it is made up

of galactose and glucose.

That is, it is made up of beta,

D, galactose and beta D. Glucose,

and it is a major animal energy source.

The linkage is beta 14.

Glycosidic linkage maltose is

made up of two glucose units and

the linkage is A14 glycosidic

linkage and it is a dimer that is

derived from starch and glycogen.

Next we move on to the concept of

reducing and non reducing sugars

reducing sugars are the sugars which

have a free aldehyde or ketone.

Group in there whereas non reducing sugars.

They don't have a free rdy ****

or ketonic group,

so any carbohydrate that reacts with

an oxidizing agent to form an aldonic

acid is classified as a reducing sugar.

So oxidizing agent is an agent

which oxidizes somebody else

but itself undergoes reduction.

Now all monosaccharides weather aldoses

or ketoses in their hemiacetal or

hammock it'll form are reducing sugars.

They are reducing sugars as they have

the capacity to reduce the cupric ion

of failings or benedix reagent and

reducing sugars exhibit mutarotation.

Whereas on the other hand,

nonreducing sugars do not exhibit

mutarotation,

all disaccharides are reducing

sugars except sucrose entry Hallows.

Sucrose entry Hallows are not

capable of reducing the ferric.

Or the cupric ion because

in sucrose entry Hallows,

the anomeric carbon of both the

monosaccharides participate in

glycosidic bond formation so there

is no free anomeric carbon atom.

As a result,

it cannot react with the cupric

of ferric ion and bring about

reduction whereas reducing sugars

are oxidized by the copper ion in

solution to form carboxylic acid.

And a reddish PPT of copper oxide.

These are the references.

Thank you.