Hello students. I welcome you all for this session.

My name is Doctor Rasika Desai Gaokar . And I will be covering up the unit sterilization.

The name of this module is sterilization using moist heat.

The code of the paper is M IG101and the title is introduction

and scope of microbiology.

The outline of this particular module includes sterilization

using moist heat.

The main instrument that is the autoclave which is used.

The principle of this particular instrument and the

working of this instrument.

The learning outcomes include.

You will be able to define the term sterilization,

explain the principle of sterilization using moist

heat.

Define the term autoclave. Explain the

principle of the autoclave and the working

of the autoclave.

Coming to the term

sterilization. Basically,sterilization is a process

of destroying all forms of microbial life.

Which would include fungi,bacteria, viruses present on a

particular surface, or contained in a fluid or in a biological culture medium.Sterilization is a fundamental word to microbiology because it provides an environment free from living microorganisms. These sterile environments we would call them. In liquid or solid can then be used to grow a single type of microorganism, specially when we want to use a pure culture. That is a single species of a particular culture. In a non sterile situation, many microorganisms could grow together, therefore sterilization is a must. Sterilization is applied in three ways. It would include steam sterilization, free flowing steam and compressed team which is used in the autoclave. Coming to sterilization using moist heat. The compressed steam method. This team is produced in a totally packed heat container. A very good example in day-to-day life of this compressed team is a pressure cooker. The most widely used and most dependable method. It is nontoxic, inexpensive, rapidly microbicidal means it

kills all kinds of microorganisms and sporicidal

means it kills all spores.

Moist heat sterilization using the autoclave is

commonly used for sterilization of culture,

media solutions, discarded cultures, and contaminated

materials.

Coming to the instrument, the

autoclave. An autoclave is an equipment which uses steam under

pressure to kill harmful bacteria, viruses, fungi and

spores on the items that are placed inside this pressure

vessel. This particular instrument was first

invented by Charles Chamberland in the 18th

century.

The word autoclave is derived from the two Greek words auto,

which stands for self and clavis which stands for self locking

device. An autoclave is used to carry out industrial and

scientific processes requiring elevated temperature and

pressure in relation to ambient

pressure temperatures.Autoclaves are generally of two

types, vertical autoclave and horizontal autoclave that have an

operation to achieve. Sterility depends on the nature of the

material being sterilized,

The types of autoclave which are involved and the

volume of it.

Now, this particular picture shows how the autoclave looks.

The auto autoclave works on the principle of

compressed heat or compressed steam. We

would call it.

It consists of a double jacketed steam chamber which permits the

chamber to be filled with saturated steam. The steam

cannot escape out.

So that is why it is called compressed steam, like how it is

in a pressure cooker.

It can be maintained at a designated temperature and

pressure. The autoclave is operated at 121.6 degrees

Centigrade. This is a very typical characteristic of an

autoclave because generally boiling water temperature is

100 degree centigrade. Since this is compressed steam steam is not allowed to

escape. The temperature reaches121.6 degrees centigrade and a

pressure of 15 pounds per square inch is generated inside the

autoclave. The autoclave works on the principle of moist heat

sterilization, where steam,under pressure, is used to

sterilize the material present inside the chamber.

The high pressure of which is generated thus increases the boiling point of water and helps achieve a higher temperature for sterilization. The air in the chamber must be completely replaced by steam.

So when this steam now comes incontact with any surface, it would kill the microbes by giving off latent heat.

The condensed liquid ensures the moist killing of all the microbes. Once the sterilization phase is completed, the pressure is released from inside of the chamber through a whistle.

Now, this particular diagram shows the schematic representation of an autoclave where you can see the steam is compressed OK,and this steam is sterilizing the material which is present inside the conical flask.

Coming to the working of an autoclave, the autoclave basically contains a sterilizer or sterilizing chamber to place the articles. A steam jacket where steam is maintained, the steam flows from the steam jacket into the sterilizing chamber. The cool air is forced

Out and a special valve increases the pressure to 15 pounds per square inch,which is above normal

atmospheric pressure.

The air in the in the chamber is thus flashed out and it is

filled with saturated steam.What is boiled to produce steam

which is released through the jacket and into the autoclave

chamber.The hot saturated steam enters the chamber and the

desired temperature and pressure, usually 121 degrees

Centigrade, is attained.

At this temperature, saturated steam destroys all vegetative

cells and endospores.

The moist heat kills effectively by degrading the

nucleic acids of the microorganisms and by

denaturing enzymes.

And essential proteins.

It also disrupts cell membranes.

The chamber is closed tightly so that the steam keeps on filling

into it, and the pressure

gradually increases and the items to be sterilized get

completely surrounded by saturated steam moist heat,

which on contact with the surface material to be

sterilized, condensed to release its latent heat of condensation.

The usual temperature achieved is 121.6 degrees Centigrade at

a pressure of 15 pounds and Exposure time is 15 to 20

minutes. You have to hold it at that particular temperature

and pressure for 20 minutes .By increasing the temperature,

the time for sterilizing is further reduced. These are the

references.

Thank you.