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DEPARTMENT : MLT 2ND SEMESTER

SECTION:B

Assignment :Basic Microbiology

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Q1. Write the names and function of different equipments used in microbiology lab.

1:Analytical Balance

Function:

1. **These types of balances are made with a measuring pan enclosed in a transparent covering that prevents smalls particles or air currents from getting collected on the pan.**
2. **An electric analytical balance uses the force necessary to counteract the mass rather than measuring the mass itself.**
3. **An electromagnet is used to create a force required to achieve a balance with the mass of the substance, and the resulting force is displayed.**

2. Autoclave

Function:

4. **Autoclaves use steam as their sterilization agent. The basic principle of an autoclave is that all the items within the autoclave come in direct contact with the steam for a particular period irrespective of the nature of the material- whether it is liquid, plastic ware, or glassware.**
5. **The amount of time and the temperature depends on the type of material being sterilized and the increase in temperature of the cycle allows for shorter periods.**

3. Bunsen burner

Function:

A Bunsen burner, named after Robert Bunsen, is a common piece of laboratory equipment that produces a single open gas flame, which is used for heating, sterilization, and combustion. The gas can be natural gas (which is mainly methane) or a liquefied petroleum gas, such as propane, butane, or a mixture of both.

4. Centrifuge

Function:

A centrifuge is a laboratory device that is used for the separation of fluids, gas or liquid, based on density. Separation is achieved by spinning a vessel containing material at high speed;
the centrifugal force pushes heavier materials to the outside of the vessel.

5. Colony Counter

Function:

Colony counters are used to estimate a liquid culture's density of microorganisms by counting individual colonies on an agar plate, slide, mini gel, or Petri dish. Typical applications include Ames testing, bacterial mutation assays, and E. coli bacterial colonies.

6. Deep Freezer

Function :

Deep Freezers for Medical Laboratories. Deep freezers are the testing equipment that are used to preserve and store food products, medical equipment, blood samples, medicines and injections, etc. for a long period of time. Deep Freezers are used for industrial purposes as well as for household purposes.

7. Homogenizer

Function:

A homogenizer is a piece of laboratory or industrial equipment used for the homogenization of various types of material, such as tissue, plant, food, soil, and many others. Many different models have been developed using various physical technologies for disruption.

8. Hot plate

Function:

In scientific research

In laboratory settings, hot plates are generally used to heat glassware or its contents. Some hot plates also contain a magnetic stirrer, allowin.

9. Hot air oven

Function:

Hot air ovens are electrical devices which use dry heat to sterilize. They were originally developed by Pasteur. Generally, they use a thermostat to control the temperature. Their double walled insulation keeps the heat in and conserves energy, the inner layer being a poor conductor and outer layer being metallic .

10. Incubator

Function :

An incubator is a device used to grow and maintain microbiological cultures or cell cultures. The incubator maintains optimal temperature, humidity and other conditions such as the CO_2 and oxygen content of the atmosphere inside.

11. Laminar Air Flow/ Laminar Hood

Function:

A laminar flow cabinet or tissue culture hood is a carefully enclosed bench designed to prevent contamination of semiconductor wafers, biological samples, or any particle sensitive materials. Air is drawn through a HEPA filter and blown in a very smooth, laminar flow towards the user.

12. Magnetic Stirrer

Function:

A magnetic stirrer is a device widely used in laboratories and consists of a rotating magnet or a stationary electromagnet that creates a rotating magnetic field. This device is used to make a stir bar, immerse in a liquid, quickly spin, or stirring or mixing a solution,

13. Microscope

Function:

First, the purpose of a microscope is to magnify a small object or to magnify the fine details of a larger object in order to examine minute specimens that cannot be seen by the naked eye.

14. pH Meter

Function:

PH meter, electric device used to measure hydrogen-ion activity (acidity or alkalinity) in solution. Fundamentally, a pH meter consists of a voltmeter attached to a pH-responsive electrode and a reference (unvarying) electrode.

15. Spectrophotometer

Function:

A spectrophotometer is an instrument that measures the amount of photons (the intensity of light) absorbed after it passes through sample solution. With the spectrophotometer, the amount of a known chemical substance (concentrations) can also be determined by measuring the intensity of light detected.

16. Vortex Mixture/ Vortexer

Function:

A vortex mixer, or vortexer, is a simple device used commonly in laboratories to mix small vials of liquid. ... When a test tube or other appropriate container is pressed into the rubber cup (or touched to its edge) the motion is transmitted to the liquid inside and a vortex is created.

17. Water Bath

Function:

Laboratory Water Baths. A water bath is a device used in the laboratories to incubate samples in water maintained at a constant temperature. Temperature may be controlled digitally or by a dial and once set, the water bath cycles on and off to ensure constancy of the temperature.

Q2. What are the different chemical and physical methods of sterilization and disinfection?

Physical methods of sterilization-

- **Moist Heat Sterilization. At temperatures below 100°C. At a temperature of 100°C. At temperatures above 100°C.**
- **Dry heat sterilization. Red Heat. Flaming. Incineration. ...**
- **Filtration. Filtration sterilization of liquids. Filtration sterilization of gases.**
- **Irradiation. Ultraviolet (non-ionizing) radiation. Ionizing Radiation.**

Chemical methods of sterilization

The five basic types of chemical reactions are combination, decomposition, single-replacement, double-replacement, and combustion. Analyzing the reactants and products of a given reaction will allow you to place it into one of these categories. Some reactions will fit into more than one category.

Methods Of Disinfection And Disinfectant Agents Used. Generally, two methods of disinfection are used: chemical and physical. The chemical methods, of course, use chemical agents, and the physical methods use physical agents. Historically, the most widely used chemical agent is chlorine.