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**Assignment for viva**

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

####  1. Drying Oven:

For preparation of certain reagents, the glassware’s, after proper cleaning and rinsing with distilled water, are required to be dried. They are dried inside the drying oven at 100°C till the glassware’s dry up completely.

#### 2. Autoclave:

Autoclave is the nucleus of a microbiology laboratory. It is used not only to sterilize liquid substances such as prepared media and saline (diluents) solutions, but also to sterilize glassware’s, when required.

It has the same working principle as a domestic pressure cooker. The maximum temperature that can be obtained by boiling water in an open container is 100°C (boiling point of water)

#### 3. Microbiological Incubator:

Profuse growth of microbes is obtained in the laboratory by growing them at suitable temperatures. This is done by inoculating the desired microbe into a suitable culture medium and then incubating it at the temperature optimum for its growth.

#### 4. BOD Incubator (Low Temperature Incubator):

Some microbes are to be grown at lower temperatures for specific purposes. The BOD low temperature incubator (Figure 3.9), which can maintain temperatures from 50°C to as low as 2-3°C is used for incubation in such cases.

#### 5. Fridge (Refrigerator):

It serves as a repository for thermo labile chemicals, solutions, antibiotics, serums and biochemical reagents at cooler temperatures and even at sub-zero temperatures (at less than 0°C). Stock cultures of bacteria are also stored in it between sub-culturing periods. It is also used for the storage of sterilized media, so as to prevent their dehydration.

#### 6. Deep-fridge:

It is used to store chemicals and preserve samples at very low sub-zero temperatures.

#### 7. Electronic Top-pan Balance:

It is used for weighing large quantities of media and other chemicals, where precise weighing is not of much importance.

#### 8. Electronic Analytical Balance:

It is used to weigh small quantities of chemicals and samples precisely and quickly.

#### 9. Double-pan Analytical Balance:

It is used to weigh chemicals and samples precisely. Weighing takes more time, for which it is used in emergency only.

#### 10. Distilled Water Plant:

Water is used in the preparation of media and reagents. If the media are prepared using tap water, the chemical impurities present in it may interfere with the growth of the microorganisms in the media. Moreover, the higher is the bacteria content of the media, the longer is the time required for their sterilization and greater is the chance of survival of some bacteria.

#### 11. pH Meter:

A pH meter is an instrument for determining the pH of liquid media, liquid samples and buffers. It has a glass pH electrode. When not in use, it should be kept half immersed in water contained in a small beaker and preferably be covered by a bell jar to avoid dust accumulation in the water and loss of water through evaporation.

#### 12. Hot Plate:

Hot plate is used to heat chemicals and reagents. The hot plate is made of an iron plate, which gets heated by an electric heating element from below. The required degree of heating is obtained by a regulator.

#### 13. Shaking Water Bath:

Sometimes, heating at very precise temperatures is required. Such precise temperatures cannot be obtained in an incubator or oven, in which temperature fluctuates, though slightly. However, precise temperatures can be maintained in a water bath, which provides a stable temperature.

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

  ***PHYSICAL AND CHEMICAL MTHODS OF STERILIZITION:***-

 Sterilization can be achieved through various means, including heat, chemicals, irradiation, high pressure, and filtration. Sterilization is distinct from disinfection, sanitization, and pasteurization, in that those methods reduce rather than eliminate all forms of life and biological agents present.

  ***PHYSICAL AND CHEMICAL MTHODS OF DISINFECTION:-***

 An effective physical disinfection process is safe, energy efficient, consistently effective, and cost-effective at a larger scale. Physical methods to disinfect water include UV irradiation, heat, sunlight exposure, sonic or hydrodynamic pressure and radiation.

 Chlorination, ozone, ultraviolet light, and chloramines are primary methods fordisinfection. However, potassium permanganate, photocatalytic disinfection, nanofiltration, and chlorine dioxide can also be used. Organic material is naturally present in water.