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* ***Question No: 1***
* ***Microscope:***
* The word microscope is derived from Greek word “Micro” means “small” and “Scopion” means “to see”.
* It is instrument that we use to see the very small object, that we can’t see through the naked eye.
* Microscope magnified the small object to various time large, and visible to the naked eye.
* A microscope have at least two lenses or more than two lenses to create the extremely magnitude image.
* ***Principles of Microscope:***

There are three principles of microscope;

1. Magnification
2. Resolution
3. Contrast
4. ***Magnification:***

Enlargement of the images . It is done by the two lenses, objective lens and ocular lens. Objective lens is close to the specimen and magnified and create the real image and it send into focal plan then ocular lens magnified and produce the final image.

1. ***Resolution:***

When the two images seems like one, it doesn’t have resolution. Increased magnification blurred the images. The lens who has high resolution power depend on the numerical aperture and wave length of light. It clear and the detail of two images.

1. ***Contrast:***

Different in light intensity between images and background intensity to produce the details visible to the eye.

* ***Question No: 2***
* ***Chromatography***

# *History:*

The paper chromatography was discovered by the first time by the Martin and Synge in 1943 **OR** the Dr.Mikhail S. Tsvet discovers a system that is same to the paper chromatography in 19th century.

# *Explanation:*

The word chromatography is the combination of two words “Chroma” means “color” and “graphy” means ‘measure, plot or trace etc”.

It is a technique used for the separation of many components of a mixture.

The compounds those are nearly related are the; amino acids, vitamins, lipids, proteins and drugs.

This technique is used in the;

1. Chemical and Biochemical Field
2. Biological Field
3. And the various Industries

# *Phases of Chromatography*:

1. Mobile phase
2. Stationary Phase
3. ***Mobile Phase:***

It may be gas or a liquid, which carries the material at various level for separating. Above the stationary phase.

1. ***Stationary Phase:***

(It may liquid or solid, attach with solid)

It is covered by the metal or glass. It is material on which sample attach or adhere.

* ***Question No: 3***
* ***Flamephotometery:***

Is a device used to measure the quantity of various compound or metal ions between them calcium, sodium and potassium. Flamephotometery is established on the principle that in a flame various compound are thermally dissociate. Some atoms are produced and activated to high energy level. When these electrons again come near to their lower orbit they will be dissociate and enite energy.

* ***Applications of Flamephotometery:***
1. Flamephotometers are used to determine the quantity of sodium, calcium and potassium and etc.
2. Flame[hotometery is also used in the pharmaceutical industries to check the chemical reagents in the pharmaceutics.
3. In the beverages industries it is used to determine the amount of potassium and calcium in the beverages such as fruit juices, soft drinks and vegetable juices.
4. In the food industries the standard of food products can check and regulate by the flamephotometery.
5. This technique is also used for the analysis of water and soil, and through this check the requirements of the fertilizers.
6. Flamephotometers is used to find the earth metals such as, alkali and alkaline earth elements.
* ***Question No: 4***
* ***Centrifuge:***

The word centrifuge comes from Latin words “centrum” means “center” and “fuge” means “to escape”.

The centrifuge is a device used to separate the particles from a solution. This device separate the particles on the basis of their:

Shape

Size

Viscosity of medium

Density

And the speed of rotors

* ***Components of Centrifuge:***

A centrifuge device consist the following basic components;

1. ***Electric Motor:***

It provides the electric power to turn on the rotor.

1. ***Shaft:***

The main function of the shaft is convey the input power to the centrifuge pump.

1. ***Rotor:***

Head of the centrifuge.

1. ***Hanging Buckets:***

Are the holders that hangs the solution or sample tubes.

1. ***Timer:***

It use to manage the time.

1. ***Tachometer:***

Tachometer is used to determine the speed of a centrifuge.

1. ***Power Switch:***

Is used to provide electricity to the electric motor.

1. ***Brake:***

It function as stopping.

* ***Question No: 5***
* ***Water Bath:***

Water bath is a labortary device , it is used for heat the samples in water. Water bath also maintained the water at constant temperature.

Water bath provide heat to samples or fluids for longer period of time, at constant temperature but there is no changing occurs in the concentration through evaporation.

Water bath are acquired from simple heated vessel to an instrument. It is accessible in range from 2 liter to 28 liters.

* ***Components of Water bath:***
1. ***Vessel or Trough:***

Made of insulated metal and generally they are stainless and the insulated lid may present or may not.

1. ***Electric Element:***

Provide heat to the vessel or trough and heat the water.

1. ***Propeller or Stirror:***

Used to circulate the water to maintain the uniform temperature.

1. ***Thermometer:***

To examine the temperature.

Set at various places to check temperature.

1. ***Thermostate:***

Used to balanced the temperature at constant level.

* ***Applications of Water Bath:***
* It is used to incubate specimen at constant temperature e.g. in microbial immunity and haematology.
* It is used in the blood banking ( Thawing fresh frozen plasma ) and coagulation test.
* It used to heat the chemical reagents.
* It used to melt the matter.
* It is used to increase the solubility.
* It is used in the microbiology to incubate the bottle of culture.
* ***Question No: 6***
* ***Types of Centrifuge:***
1. ***Small Benchtop Centrifuge:***

It has low speed, mostly used for the materials that fastly settle down at bottom.

1. ***Large Capacity Centrifuge:***

It is designed with advance usefulness. It is easy to use and have good performance. It give remade separation for large rate of transfer application I.e, blood banking etc.

1. ***Analytical Centrifuge:***

It has very high speed. Give high production rate with the excellent escalation rate. It is used In the molecular biology.

1. ***Ultra Centrifuge:***

It also has excellent speed and protection. It is used for the macromolecules separation.

* ***Types of Rotors:***
1. ***Swing Bucket Rotor:***

Swing bucket rotor holds samples, ranges from 36 ml to 2.2 ml.

At rest in vertical position. During the rotor acceleration swingout horizontal.

1. ***Fixed Angle Rotors:***

The rotor is set on fixed angle between 14 degree and 40 degree to vertical.

It is mainly used for pellet application.

Range of rotor is from 0.2 ml to 1 ml.

1. ***Vertical Rotors:***

Vertical rotor have very little K factor.

It specially used in the cesium to band the DNA.

The tube in the rotor’s body are vertically at all time parallel position.

***END***