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Assignment = Biomedical instrumentation

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Q1: what is microscope? Explain principal of microscope ?.

Ans: Microscope:

Microscope is an optical instrument use to see the small organism that we can not see on naked eyes, such as animal cells, plants cells or mineral sample.

Principle of microscope:

* Magnification:
* To enlarge the image
* In light microscope, light rays which are passed through the specimen are transmitted through to sets of lenses, the objective and eyepiece, the magnified image of specimen are first produced by the objective image which are known as primary image. then the eyepiece magnified by the primary image into final image.
* Resolution:
* Separate the details of two particle in image.
* The increase in magnifying power of the objective depends on the resolving power.
* Contrast:
* To produce the detail visible of eye
* The difference in light intensity between the image and the adjacent background relative to overall background intensity.

Q2: Describe chromatography and its phases

Ans: Chromatography: chroma means “ colour ” and graphy means plot or trace , measure or draw etc.

This is a lab technique used for the separation, identification, and purification of the components from the mixture for qualitative and quantitative analysis.

Phases: it consist of two phases

1. Mobile phase
2. Stationary phase

Mobile phase: when the mixture dissolved in the fluid called mobile phase

Stationary phase: the substance on which the adsorption (adhesion or attack) of the sample take place.

Q3: write down the application of flame photometry ?

Ans: Flame photometry:

* It is used for determining the concentration of certain metals ions or electrolytes such as sodium, potassium and calcium etc.
* Flame photometer are commonly used for the quantitative estimation of sodium, potassium etc
* In field of farming and agriculture the technique is applied for soil analysis to check the fertliser requirements
* In beverages industry, soft drinks and fruit juice can be analysed by using flame photometer.

Q4 : Explain the components of centrifuge ?

Ans : centrifuge: a centrifuge used for separation for particles from the solution according to their size, shape, density, viscosity, of the medium, speed.

Components:

* Rotor, head of centrifuge
* Drave shaft: the main function of shaft is centrifuge is to transmit input power
* Hanging bucket: to hang tube
* Motor: provide the power to turn the rotor
* Power switch
* Timer
* Tachometer
* Brake

Q5: write a note on water bath.?

Ans : water bath:

* Water bath is a device used in laborites to incubate samples in water maintained at a constant temperature.
* Some water baths have an additional shaking or stirring mechanism that can be set at varying speeds.

Components:

* A trough of insulated metal, usually stain less steel or of heat-resistant glass, with without, an insulated lid
* An electric element to heat the water contained in through
* A thermometer to check the temperature. This may be built in or placed separately in the through
* A thermostat to maintain the temperature at a constant level

Operation :

* Ill the trough clean (preferably distilled water to a desired level ci
* Set the thermostat to the desired temperature and allow the water to warm that temperature, Check the temperature from the thermometer
* Place the container that are to be warmed or incubated in the trough.

There are three types of water bath

* Circulating water bath
* Non circulating water bath
* Shaking water bath

Q6 : Explain the types of centrifuges ?

Types of centrifuges:

(1): Desk top centrifuge:

* They are very simple and small
* Their maximum speed is 3000 rpm
* They don’t have any temperature regulatory system

(2): High speed centrifuges:

* Maximum speed of 25000 rpm, provide 90000g centrifugal forces
* Temperature maintained at 0-4 degree centigrade by means of thermocouple
* Equipped with refrigeration remove heat generation
* Also useful isolating the sub cellular organelles (nuclei, mitochondria)

(3): Ultracentrifuges:

* Operate at speed of 75000 rpm, providing the centrifugal force of 500,000g.
* Also have refrigeration system
* Maintain temperature 0-4 degree centigrade
* Rotor system is always enclosed in a heavy armor plate
* The centrifugation for isolation and purification of component is known as preparatory centrifugation while that carried out with a desire characterization is known as analytical centrifugation.