**Mid-Term Exam (spring-20)**

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Subject: -Lab instauration Instructor: - Mam Saima hadi

Q1:-Define magnification and resolution?

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| --- | --- | --- |
| **S NO** | **Magnification power** | **Resolution power** |
| **1** | It is the ratio of the size of an object seen under the microscope in the full size seen with unaided eye. | The ability in which differentiate two close points as separate from each other. |
| **2** | The total magnification of a microscope is calculated by multiplying the magnifying power of the object lens by the eye pieces.  | The Resolution power of human eye is 0.25 mm. |
| **3** | Magnification power is how much bagger a sample appears to be under the microscope then it is in real life.  | The light microscope can separate dots that are 0.25 micro meter.  |
| **4** | Ocular: eyepieces(10X)Objective:4X-100X  | The electron microscope can separate dots that are 0.5nm. |

**Q2: -Write down the components of microscope?**

Microscope is the optical instrument used for viewing very small object such as bacteria, animal or plant cell.

 Microscope have two types of component

|  |  |  |  |
| --- | --- | --- | --- |
| S.No | **Optical component**  | S.No | **Non- optical component**  |
|  | The component which light can pass through  |  | The component which light can’t not pass through |
| **1** | Light sources  | **6** | Stage  |
| **2** | Condensers  | **7** | Base  |
| **3** | Objectives  | **8** | Diaphragm  |
| **4** | Eyes pieces  | **9** | Revolving Nose  |
| **5** | Power card  | **10** | Course and fine adjustments |

 **One by one can explain as under**

**1: -Light Source** provide the light to microscope

Two types of lens use (A)Oil Lamps (B)Low voltage electric lamps

**2: - Condensers** focus the light into plane of the object

**3: - Objectives** 9-15 pieces of element are present in the oil

**4: - Eyes pieces** provide magnification power and mostly contain uni ocular and bi ocular lenses IpEs

**5: -Power card** provide current to microscope

**6: -Stage** Grip the slide

**7: - Base** support the whole microscope

**8: - Diaphragm** Control the concentration and size of the light to microscope

**9: - Revolving Nose** It’s easily rotate to change their magnification and contain 3-4 lenes

**10: - Course and fine adjustments**

Course control up and down movement of the microscope

Fine control focusing

**Q3: Write note on flame photometry?**

**History** The flame photometry is early work done by the Robert Bunsen and gluster Kirchhoff in 1860s.

 **Deification** Also called flame atomic emission spectrometry.

* It is used for inorganic chemical analysis to determine the amount of certain element like sodium, potassium, lithium.
* The principle of flame photometry is based on the measurement of the emitted light intensity. when a metal is introduced into the flames.
* The wavelength of the color tells what the element is (qualitative)
* The color of intensity tells us how much of element are present(quantitative)
* The flame photometry took 2-3 days to obtain result.
* The different element has different wavelength based on their size.

**For example**

* Sodium emitted light wavelength 589mm
* Potassium emitted light wavelength 767mm
* Lithium emitted light wavelength 671mm
* Calcium emitted light wavelength 622mm

**Components** Flame photometry contain 6 components

1.burner

2.nebuilzer

3.Lenes

4.filter

5.photodectors

6.red out device

**Application**

* Flame photometry is used to determination of alkali and alkaline earth metals.
* Used to determine of lead in petrol.

**Q4:-Describe chromatography and its types?**

**History** Chromatography was first developed by the Russian botanist Mikhail tswett in 1903 as he produced a color full separation of plant pigment through a column of calcium carbonate.

* Chromatography is use for the separation and identification of compound.

**Explication** Chromatography is the method of separation in which the compound to be separated are disturbed between two phases, one is called stationary phase and microbial phase.

* Stationary phase in a specific direction.
* The stationary phase can be solid or liquid and the mobile phase can be liquid, gas or supercritical fluid.

**Classification of chromatography**

* They are divided into two parts.

|  |  |  |
| --- | --- | --- |
| **S:No** | **Planner chromatography**  | **Column chromatography** |
| 1 | Is a stationary phase being support on the interstice of a paper and the mobile phase is capillary action? | It is a stationary phase which occur in the narrow tube through which the mobile phase is focus under pressure or gravity.  |
| 2 | Separate zone appears as indusial sports. | Deduct the separate zone of the solute. |
| 3 | Different compound in the sample mixture travel different distance according to how strong they are interacting with the stationary phase compare to mobile phase. | Zone appear as peaks. |
| 4 | They are divided into two types. | The main principle of column chromatography to absorbed solute of solution in stationary phase.   |

**Q5**: **-What is centrifuge also explain its uses?**

**History** In 1923 Theodore Svedberg developed the centrifuge to separate the particles from each other.

* Centrifuge quickly become a laboratory tools.
* Cellular organelle identification in 1929s.
* Used to identify sub units of hemoglobin in 1930s.

**Definition** The centrifuge works using the sedimentation principle where the centripetal acceleration causes denser substance and particle to move outward in the radial direction. At the same time object that are less denser and move to center.

OR

* A machine which are rapidly rotating container that apply centrifugal force to its contents typical to separate fluids of different densities **for example** cream for milk or liquid from solid.

OR

* Centrifuge is device that rapidly Spain

**Function of centrifuge**

* A centrifuge use to separate serum, urine and blood sedimentation.
* Remove cellular elements from blood to provide cell free serum or plasma.
* Conc.cellular element for microscope.
* Remove protein precipitate from analytic sample.
* Isolation of micro molecule such as DNA RNA and protein or lipids.
* Uses of hematology lab for PCV determination.

**Q5: -Explain the components of water bath?**

**Water Bath** I

s a container of water heated to a given temperature which used for a substance or element/specimen which placed in smaller containers.

Or

* Water bath is a device which maintain the water at specific temperature.

Or

* A water bath is a laboratory instrument which are made from container filled with heated water. It uses to incubate samples in water at a specific temperature for a long time.

 **Components of water bath**

There are five components of water bath.

1.Vessel

2.Electric Elements

3.Propellar or Stirrer

4.Thermostat

5.Thermometer

**1.Vesscle** is insulated metals are usually made up of stainless stress.

**2.Electric Elements** to heat the water contained in the vessel, electric element is used.

**3.Propellar or Stirrer** in order to maintain a constant temperature, water is circulated through propellers or stirrers.

**4.Thermostate** Is maintained the temperature at uniform level in a water bath.

**5.Thermometer** is used to gauge the temperature, placed separately in the vessel.