**Final -Term Assignment (spring-20)**

**Course Title: biomedical \ lab instrumentions (MLT)**

 **Instructor: Saima hadi**

**Marks: 50**

Attempt all questions .Each question carry 10 marks.

Q1. Define the following terms.

1. PH Meter
2. Vortex Mixer
3. Balance
4. Water still
5. Deionizer

Q2.Describe Electrophoresis and its importance?

Q3.Write a note on Flow Cytometery?

Explain Autoclave , its uses ,and components?

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COURSE TITLE BIOMEDICAL LAB ISNSTRUMETIOS

INSTRUCTOR: SAIMA HADI

QNO1: Difine the following terms.

1. PH METER: It is device used for the measurement of PH solution

A simple and speedy device to measure the acidity and alkalinity of fliud.

The PH meter was invented in 1934 by the American chemist are anrold O.Beckmen to measure sourness of lemons

1. VORTEX MIXER :A vortex mixer or vortexer is a simple device used commonly in lab to mix small vast of liquid ,

A picec of lab aqupment used to mix the content of small tubs of liquid by mean of rapid oscllation

1. WATER STILL :it is an instrument used in lab for parification of water .

A level secation of a water way where no current is discernible and water is still.

1. DEIONIZER: IT is an instrument used in lab for purification of water .

The removal of ion from a solution using ion exchange process

Deionzer is used for water purifications and for medical purposes.

Q2.Describe Electrophoresis and its importance?

Ans :electrophoresis :term mean migration with electricity.

Involes the separation of components of a semple by differential rate of migration in the presence of electric field.

Or

Migration of charged partce or molecules under the influnace of electric current .

Literally =greek word means transport by electricity.

Theory was first proposed by prof Ferdinand F reuss by doing experiment on migration of colloidal clay particals.

PRINCIPALE: Molecules moves with the speed dependent on their charge ,shape and size and get seprated in the presence of an electric felid

The fundamental principal behand electrophoresis is the exsiting of charge sepration between the surface of a partical and the fluid immediately surrounding it.

The electric field exerts a force on the particals charge of the surface potential

Electrophorsis is used for analysis and purificatiton of very lage molecule (protein nucleic acid)for analysis of simpler charge molecule (sugars amino acid peptides nuclotied and simpler ion )

Components

* Gel casting assembly
* container or electrophoresis tank
* Power supply
* Glass plate to hold the gel
* Comb to load sample in the gel before solidification
* The buffer tank🡪hold the buffer
* The support medium 🡪separation take place
* The detacting system.

OPERTION :

* Gel is preper adding powedered agross to liquid boiling the mixture .
* Comb is already placed which creat row of well for simple loading .
* Apply desired voltage to initate electrphorsis

Saturation of the medium with the buffer

* Sample application
* Electrophoretice sepration

Quality control :

1. Calibration of equipment
2. Good qulity and properly working of stander
3. The stander should be run to check the validity
4. Chemical must be purchesd from, supliare how guranatee the purity
5. Don’t use expair regent .
6. Buffer for QC of regent must be tested according to SOPs.

APPLICATION:

SEPRATION OF PROTEIN DNA ,RNA and other micromolecule

Purification and analysis of vaccine and antibiotic .

Q3.Write a note on Flow Cytometery?

Is a technology that is used to a analysis physical chemaicl charectertic of particls and a fluid is it passes through at least one laser .

Cell component are fluorescently lablled and then exucted by the laser to eimte light at varying wavelength

Up to thousand of particals per second can be analysied as they pass through liquid steam

Example of properties measured include particales relative granularty sixe and fluorcscence intensity as well as its iternal complexity .

Main contents pf flow cytomerter

Fluid

Purpose of the fliides system is to transport the particles in a sterm of fluid to laser beam where they are interrigetd

If cell are from solid tissue the they requrid disaggregation befor they can b analyser

Although cell from animal plat bacteri yeast or alge are usually measurd other particale such as chromosomes or nuclei can also be exaimed

Some particle such as marine algae are naturally fluorescent but in general fiurescent labels are required to tag component of the partical

Section of fluid stream that contains particals is referred as sampl cors

Optics system

Lasers which illuminate particals present in streams as they they pass through and scatter light from lysar

Florasence which molecule that are patrticles emit florasecnse which is detacted by carefully position lynses

Light scetal from uomto 6 or more cloresense is determond for tow different angles

Filled of application

Molecular biology pathology immunology a special by mean transplantation hematology tumer immunology and chemotherapy pretainal diagnose ang genetics extensivel used resurch for detaction of DNA demage

Perameter

* Cell pegmint such as chlorphile
* Totl DNA content cell cycle analysis cell kayntivc floloreperatio plooidy endoredopliacton etc.
* Total rna content
* DNA COPIE NO VERATION (by flow fish techanalogy )
* Protein expration and localization
* Cell surface antigen (cluster diffreneatin cd mraker)
* Intra cellura antigen
* Nuclar anten
* Enzy=matic activity
* Oxitative burst

Explain Autoclave , its uses ,and components?

ANS autoclave is a pressur chamber used for the sterilization the insteroment is aslso turand as sterilizer

This instrument was fisrt devevelps and its crude from by dr denis npapin and name it is a steam digester the steam

Was the foreunnare of lab auclave invinted in 1879 by dr Charles chebre land

Use

Surgical instrument p

Plastic sharpn container

Glassware

Plastic tube and pipitete tips

Solution and water

Animl food and beeding

Component

The chamber is the primry component is a stream autoclave consisting of inner chamber and outer jacket

Control systm

Thermostatic trap safty walwe

Wast water cooling mechanism

Vacuum system (if aaplicable)steam gernater (if applicable )

What do know about beer lamert law (uses principle)

ASN the law was first develp by pierre bouguer befor 1729 it was latter attributed to johann heinrich lambert how sited bouguer finding the law including path length is a varibal that effacted absorbance latter beer exctended 1852 the law include the concentraton of suloton thus giving the law its name beer lamert law .

Uses

The beer lambert law relats the attenuation through a light to the propteis of thematreial through which the light is travling this it’s a breef looks at the beer lamert lwaw and exlain use of the trun absorbance and molar absorbe activity relating to UV –visibal absorbtion spectrometry

Principal

Where each Tx is the optical depth whose subscript identifies the sources the absoupation of the scattring

Areefer to aerosols (that absorb and scatter

No2 is mindly due to urben polloation absorbtion only

RS effcct due to raman scarting in the attmosphari

W IS WATER wepar abbsorpation

O3is ozone (abbsorbtion only)

R is Rayleigh scrting from a molecular o2 and N2 RESPONSEBALE for the blue color of the sky. Explain Autoclave , its uses ,and components?

Explain Autoclave , its uses ,and components?