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# **Department of Zoology**

**Research Consultancy**

## **FT-IR SPECTROPHOTOMETER (FTIR) - SHIMADZU, JAPAN**

**COST: 8, 73,252/- INR**

IR spectroscopy involves the absorption of infrared radiation having energy equal to the vibrational energy levels of molecules under investigation. FTIR spectroscopy provides structural information of the samples. The low energy infra red



radiations are appropriate to execute molecular vibrations. The absorption of energy causes the bonds between atoms to be executed to higher energy levels. From This characteristics bonds, one can determine a great deal about the structure of molecule. Thus IR spectra provide strong evidence for compound. Solid samples are analyzed in KBr matrix.

### **APPLICATION:**

- Identification of functional groups and characterization of materials.
- Study of reaction mechanism, phase transition and intermolecular interaction.
- Quality control of pharmaceutical products, petroleum products and food materials.

### **SAMPLE REQUIREMENTS:**

Quantity of samples required is 50 mg in solid/ liquid state of FT-IR. For solution studies solvent should be specified.

**CLINICAL BIOCHEMICAL ANALYSER 635 SYSTRONIC  
AHMEDABAD cost-**

Systronic Clinical Analyser 635 is a micro-controller semi-auto analyzer. This instrument is stand alone and having advanced user friendly software with latest performance features including rate calculations with solid



state temperature control, suitable for chemistries and Enzymes. It has facility for calibrating with multi standards, which makes it for calculating the sample results by non linear curve fitting technique. This will take care of normal needs in a clinical laboratory conveniently and efficiently. It has unique feature of taking volumes of samples according to user's requirement. Optional external 80- column, Dot- Matrix Printer facility can be used to print out details of measurement conditions and all the measure data.

**APPLICATION:**

- It is used for clinical analysis of blood and other fluids: Glucose, Total Protein, Cholestrol, Alkaline Phosphatase, Acid Phosphatase etc.
- It is used to determine the enzyme level, ion level in given samples.

## **SAMPLE REQUIREMENTS:**

Various samples like serum, plasma, urine etc can be analyze as per users requirement

## **Flame Photometer 128, And FPM Compressor Systronic Ahmedabad.**

### **Cost:**

Systronics Flame Photometer 128 is a microprocessor based unit designed to provide automation in operation, measurement and end result presentation. It can do the estimation of Sodium (Na), Potassium (K), Lithium (Li) and Calcium



(Ca) in single operation. For users convenience, the two units offers two measuring modes: 1 Low Concentration and 2 High concentration. Frequently used measurement setups can be stored once and recalled whenever required with a stroke of button.

## **APPLICATION:**

- It is used to determine alkali and alkaline earth metal concentration in wide variety of samples.

## **SAMPLE REQUIREMENTS:**

It determines the concentration of ions in various samples as per user's requirement.

### **QUICK FREEZER (HORIZONTAL) RQF 170 REMI**

**ELEKTROTCHNIK LTD., THANE Cost:**

Quick freezer is designed for quick freezing and storing of blood components, Serum, Vaccines, biological and medical specimens, clinical samples etc at low temperature It is constructed of



double walls, the exterior is made of sheet steel while the interior of stainless steel having PUF insulation etc to minimize heat. It can maintain the low temperature upto  $-40^{\circ}\text{C}$ .

### **APPLICATION:**

- It is used for the preservation of various laboratory samples at low temperature.

### **SAMPLE REQUIREMENTS:**

Any laboratory sample as per the user's requirement.

**Laboratory Oven TI 115/125/126/127/128 Tempo Instrument and equipments (I) Pvt. Ltd. Mumbai. Cost: 3200/- INR**

Laboratory oven have high forced volume thermal convection application. It provides uniform temperature throughout. The process application for laboratory oven can be for annealing, die- bond curing, drying, sterilizing and other industrial laboratory functions. Different models in this oven have



their respective temperature range.

Type 115: 180°C

Type 125: 250°C

Type 126: 250°C

Type 127: 400°C

Type 128: 250°C

#### **APPLICATION:**

- It is used for the incubation and sterilization of various laboratory products at required temperature.

#### **SAMPLE REQUIREMENTS:**

- The various solid or liquid laboratory samples as per user's requirement.

## PHASE CONTRAST MICROSCOPE

Phase contrast microscopy is an optical microscopy technique that converts phase shift in light passing through a transparent specimen to brightness changes in the image. Phase shifts themselves are invisible, but become visible when shown as brightness variations. When light waves travel through a medium other than vacuum, interactions with



the medium causes the wave amplitude and phase to change in a manner dependent on the properties of the medium. Changes in amplitude arise from the scattering and absorption of light, which is often wavelength dependant and may give rise to colors. Photographic equipment and human eyes are only sensitive to amplitude variations. Without special arrangements, phase changes are therefore invisible. Phase contrast microscopy is particularly important in biology. It reveals many cellular structures, that are not visible with simple bright field's microscope. The phase contrast microscope made it possible for biologist to study living cells and how they proliferate through cell division.

### APPLICATION:

- To observe unstained micro preparations.
- To study the various cell in living conditions.

## **SAMPLE REQUIREMENTS:**

Sample required as per the standard identification of the sample specified.

## **INVERTED BIOLOGICAL MICROSCOPE CIB 100, COSLAB.**

### **Cost-**

Coslab CIB100 microscope having easy operation and provided with complete functions. It is widely used in academic demonstration and scientific research. Its big stage with extra large moving range i.e. 250×250 mm provides speedy movement by hand to get observation point immediately. It is provided with Scope Image Advanced 24 bits real color microscopy image processing software which gives large number of image processing and measurement tools suitable for all kind of microscopy image processing and measurement tasks. It also provides high quality capture and playback of multimedia streams.



## **APPLICATION:**

- It is suitable for different specimen observation with polarization set.
- It is available for measuring with digital camera and software.



- It is useful to observe the live structures of various microscopic laboratory specimens.

### **SAMPLE REQUIREMENTS:**

Sample required as per the standard identification of the sample specified.

### **GRAPHIC D PH METER 327 SYSTRONIC AHMEDABAD**

#### **Cost**

The Graphic D ph meter is a digital ph meter which is truly portable, light weight and accurate ph meter, that finds extensive applications in a field of pollution studies , soil chemistry, plant effluent and water management. The instrument uses a large LCD digital display. A specially designed combination electrode eliminates bothersome cables and jacks.



### **APPLICATION:**

- It is used to determine the concentration of hydrogen ions in aqueous solution.

**SAMPLE REQUIREMENTS:**

Any aqueous solution who's PH has to be determined.

## **Digital Electrophoresis 606 Systronic, Ahmedabad.**

### **Cost-**

The electrophoresis is a method based on the principle that a charged particles placed on an electric field moves towards the electrode of opposite polarity. Thus a negatively charged particles will move towards the positive electrode and vice-versa. Systronic Digital Electrophoresis apparatus type 606 is designed to provide the DC voltage / current source required for electrophoretic separation of proteins, amino acids, carbohydrates etc. This instrument gives maximum voltage of 500 V and a maximum current of 100 mA with facility to select the constant voltage or constant current mode of operation. The proteins, amino acids etc exist as a charged particles in a support medium and the charge depend on the  $P^H$  of the solution in which it resides. The proteins are placed on a solid or semi- solid support medium containing buffer solution. The extreme ends are dipped into two disconnected buffer chambers, each containing an electrode. A DC potential is applied between the two electrodes for a given time. After electrophoretic separation, the separated bands are analysed using a Densitometer.



### **APPLICATION:**

- It is used for the separation and analysis of macromolecules and their fragments based on their size and charge.

### **SAMPLE REQUIREMENTS:**

Sample required as per the standard identification of the sample specified.

### **Photoelectric Colorimeter- 115 Systronic, Ahmedabad.**

#### **Cost-**

Colorimetry is a technique used for measurement of concentration of a substance in a given clear solution by passing a light beam of specific colour. Systronics Photoelectric Colorimeter 115 is a versatile model which can effectively serve the



chemical and clinical group both. It can measure percentage transmittance (% T), Absorbance (ABS), Concentration (CONC) and K factor (K). The unit accept 10 mm square cuvette and round test tubes both. A wide range of wavelength, 400-700 nm is covered with the help of 8 optical filters mounted on a turret. Facility is provided to use narrow band interference filters (Optional) of users choice for specific application to achieve precise results.

#### **APPLICATION:**

- It is used to determine the concentration of substance in solution based on the intensity of color of solution.
- It is also used for analysis of water quality, analysis of soil component, monitoring of hemoglobin content in blood.

#### **SAMPLE REQUIREMENTS:**

Sample required as per the standard identification of the sample specified.

### **Spectrophotometer 106 Systronics Ahmedabad.**

**Cost-**

Systronics Spectrophotometer 106 is a single beam grating spectrophotometer with a wavelength range of 340 nm to 960 nm. It gives a constant spectral bandwidth of 10 nm over the entire wavelength range.



Measurement reading of % transmittance absorbance concentration factor are displayed digitally, as per the selected mode of observation. The cell compartment provides a two position cuvette holder of 10 mm path length, as a standard facility. 50 mm path length holder is optional.

### **APPLICATION:**

- It is used in laboratories for the study of chemical substances.
- Estimation of dissolved organic carbon concentration.

### **SAMPLE REQUIREMENTS:**

Sample required as per the standard identification of the sample specified.

## **BOD Incubator**

BOD stands for Biological Oxygen Demand which is also called low temperature incubators. Biological oxygen demand is widely used technique used to express the concentration of organic matter in water samples. It is a measure of the amount of dissolved oxygen used by microorganism in the water. If the amount of organic matter in sewage is more, the more oxygen will be utilized by microorganism to degrade dumping sewage which containing high value. Digestion of this organic compound in natural ecosystem such as lakes, rivers etc can deplete oxygen and result in fish asphyxiation. The BOD of water sample is generally measured by incubating the sample at 20°C for 5 days in the dark room under aerobic condition.



## **APPLICATIONS:**

- To establish the concentration of organic matter in waste water samples.
- To assess the quality of surface water.
- To understand the characteristics of DO contained in water and waste water.

### **SAMPLE REQUIREMENTS:**

Any water sample who's BOD has to be determined.

### **Dissolved Oxygen Meter 312 Systronics, Ahmedabad Cost-**

The Systronics Dissolved Oxygen Meter 312 is a battery operated portable instrument for estimation of dissolved oxygen (D.O.) and temperature measurement in water, waste water and



biological applications. Dissolved oxygen is measured in ppm (parts per million) over a range of 0-20 ppm with 0.1 ppm resolution and temperature is indicated in degrees centigrade from -5 to + 45 degrees Celsius. The dissolved oxygen measurement is automatically temperature compensated for solubility of oxygen in water and permeability of the probe membrane. Salinity compensation is manual. Measurements are displayed by a 3 digit LCD.

The probe supplied with the unit is a special Clark-type membrane covered polarographic sensor. A thermistor probe is also supplied for the automatic temperature compensation and measurement. A thin permeable membrane stretched over the sensor isolate the sensor elements from the environment, but allows oxygen to enter. When a polarizing voltage is supplied across the sensor, oxygen that has passed through the membrane reacts at the cathode, causing a current to flow.

#### **APPLICATION:**

- It is used to estimate the amount of dissolved oxygen in given water sample.

#### **SAMPLE REQUIREMENTS:**

Any water sample from which the dissolved oxygen has to be estimated.

**Centrifuge Type C 854/4, C854/6, R 301, R 302, R 303, R 304. REMI Motors, Mumbai. Cost:**

Centrifugation is a process which involve the use of centrifugal force for the sedimentation of heterogeneous mixtures with a centrifuge. This process is used to separate two immiscible liquids. More dense components of the mixture migrate away from the axis of centrifuge, while less dense components of the mixture migrate towards the axis. It is possible to increase the effective gravitational force on a test tube so as to more rapidly and





completely cause the precipitate together on the bottom of the test tube.

#### **APPLICATION:**

- It is used to separate two immiscible liquids.

#### **SAMPLE REQUIREMENTS:**

Sample required as per the standard identification of the sample specified.

#### **Rotary Microtome A.O. Model, Bio Aids Bombay. Cost: 365./- INR**

A Microtome is a tool used to cut extremely thin slice of material, known as sections. Microtome use different blades depending upon the specimen being sliced and desired thickness of section e.g. steel blades are used to prepare sections of animal and plant tissues for light microscopy histology. Microtome sections can be made thin enough to section a human hair across its breadth, with section thickness between 50 nm to 100 $\mu$ m.

#### **APPLICATION:**

- It is used to study histology and histopathological aspects of various animal tissues.

#### **SAMPLE REQUIREMENTS:**

Various animal tissues can be sectioned as per the requirements.

