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18/ENG04/074

ELECT/ELECT

EEE 319 ASSIGNMENT

i) Sensors for Biomedical Applications:

In biomedical field, applications of biomedical sensors are as follows:

- i) Detecting the information of clinical chemistry. In medical clinic field, the biology's information needs to be detected to ensure the present state of given biology.
  - ii) Continuous monitoring of some parameters of biology outside and inside.
  - iii) In medicine, people utilize some parameters detected by biomedical sensors to control or adjust physiological course of body.
  - iv) Biomedical sensors such as pH sensor could also be employed to detect our atmosphere and condition to improve our living situation.
- Examples of biomedical sensors are:
- Oxygen and carbon dioxide sensors (for blood)

- Heart sound sensors
- Blood pressure sensors
- Respiration sensors
- Electrochemical electrode.

ii) Actuators for Biomedical applications  
DNA interaction, detection of polymerase chain reaction products, cardiovascular activity, dissociation of biomolecules, neural activity, muscle activity and kinematics are carried out using actuators in biomedical field.

- Examples of actuators in this field include:
- microvalves
  - smart actuators
  - controlled pump

3) a) Case Study of use of Instruments to measure patients experience of healthcare quality in hospitals

A systematic review was conducted and utility critique of questionnaires to measure patients experience of healthcare quality in hospitals.

3 methods were followed.

- 1) Application of COSMIN checklists to assess the quality of psychometric study.
- 2) Critique of psychometric results of each study.
- 3) Development and critique of additional aspects of utility for each instrument.

### Results

- 1) Cost efficiency was mostly poor.
- 2) Acceptability of most instruments was good.
- 3) Educational impact was variable.

### B) Measuring nanoparticle Exposure

The project developed two methods to accurately measure and calibrate particle number concentration, by applying small-angle X-ray scattering and single-particle

inductively coupled plasma mass spectrometry, both to within 10% accuracy.

## ~~2) THERMOMETER~~

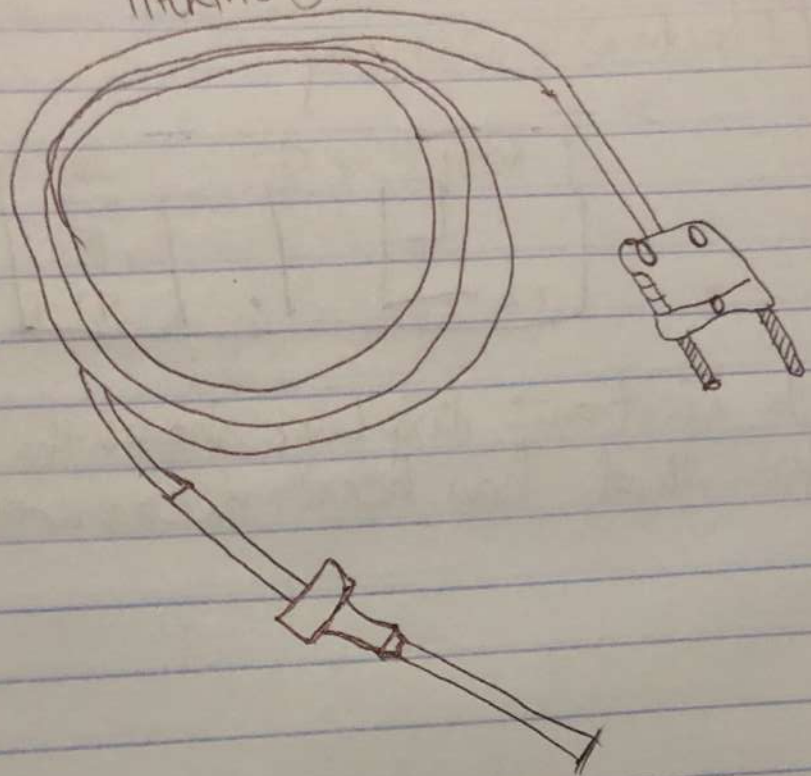
~~Three components of a thermometer include spirit-filled liquid, glass tube and black ink.~~

## 2) DIGITAL THERMOMETER

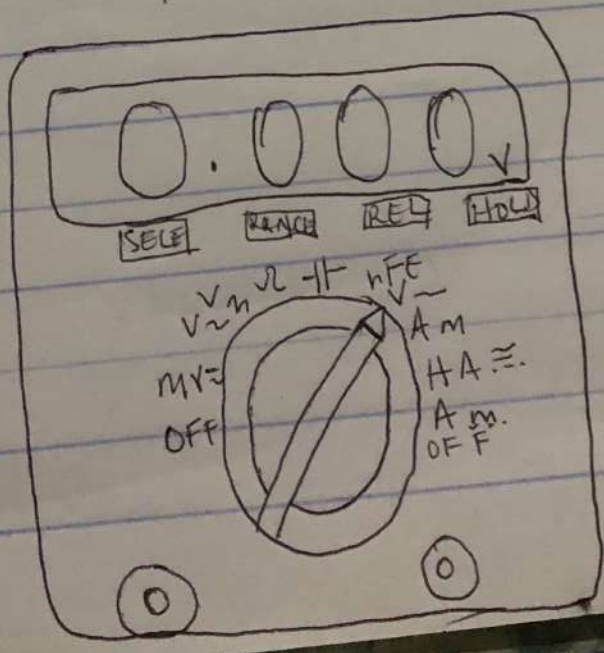
Digital thermometer consists of a thermocouple, battery-powered, dual slope digital voltmeter, and an electronic display.

1) THERMOCOUPLE: This is a sensor that is used while measuring temperature. <sup>The sensor</sup> consists of two dissimilar metal wires, joined at one end, and connected to a thermocouple-capable ~~the~~ device at the other end.

# THERMOCOUPLE



ii) Voltmeter: This instrument is used for measuring electric potential difference between two points in an electric circuit.



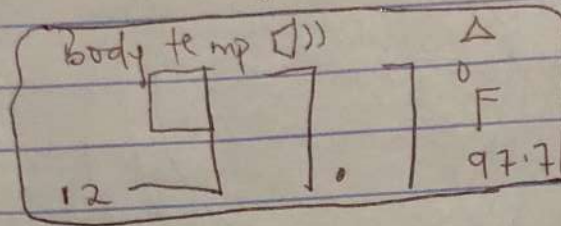
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1. Centre of Excellence Stands Trinitate  
Where true discipline enthrones  
Nurturing child, an for gre to

SCHOOL PLEDGE

I pledge to Trinitate International School,  
To be faithful, loyal

### iii) Electronic display



The electronic displays shows the output/information that has been measured by the device.