14210312

SA - Assignment -3

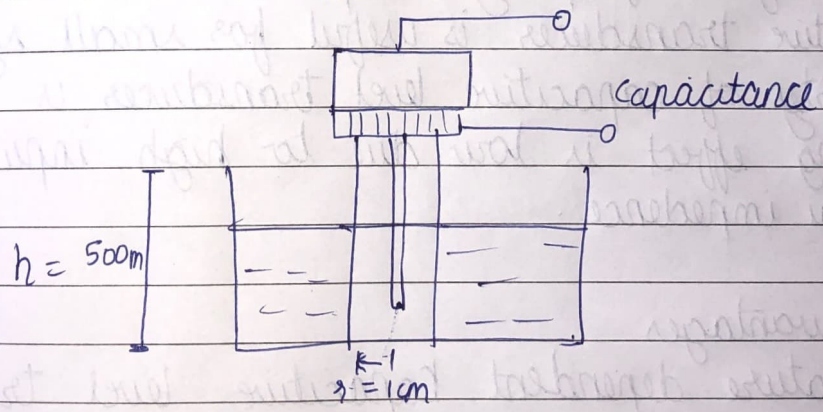
Q1) State of tank = 500cm
radius = 1cm

$$C = \frac{A \varepsilon_0 k}{d}$$

capacitance value depends on dielectric used and of plate & distance between them.

Level to current converted

1) Level is tank change, capacitance of dielectric formed below electrode & tank wall changes
2) Values of capacitance depends on temperature of other factors → material of a) wall
   b) electrode
3) Output current gives measure of level of water in the tank



Q2) Explain various transducers used for direct measurement of level. Explain one transducer in detail.

→ Ultrasonic level technology / transducer
→ float element type - level transducer

→ Capacitive level transducer
→ Pressure level transducer
→ Inductive level transducer
→ resistive level transducer

Ultrasonic level Transducer
→ Work by the time of flight presume its a method for measuring the distance between liquid & object
→ It emits ultrasonic sound pulse beam towards the liquid. Pulse is reflected back to the ultrsonic reciever pulse by the liquid pulse
→ The time diff between trasmission & received pulse is measured and caliberated to distance

Q3) State advantages of Capacitive level Transducer
→ Requires less power to operate
→ It has good frequency response.
→ capacitive transducer is useful for small system.
→ resistivity of capacitive level transducer is high
→ loading effect is low due to high input impedance.

Disadvantages
→ Temperature dependent capacitive level trasducer
→ Non linear behaviour
→ output impedance depends upon frequency used
→ Prone to errors due to dust particles

Q4) RF source is used with capacitive level transducer. Why?

-> Capacitance is formed between the level receiving probe & metallic wall of the level which acts as 2 electrodes & application media acts as dielectric.

When sensor is introduced into the verse these electrodes are seperated by insulator by suitable media. Dielectric is main factor in capacitance principle