ME3010 : MEASUREMENTS,INSTRUMENTATION AND CONTROL

IIT PALAKKAD

MINI-PROJECT

AIM : WATER LEVEL MEASUREMENT .

ONLINE SEMESTER [V SEMESTER]

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MEASURAND

This instrument will record water level , so here measurand is water level in bucket or displacement.

CONCEPTUAL DESIGN

working principle : weight of floating body balances buoyancy force of liquid .

So as you can see in diagram drawn below I have taken one ball which we use in our water tanks and have connected it to rod whose other end is connected to needle pin which deflects when there is change in water level in bucket .
Then I can caliberate using standard glass and use this as instrument to record water level .

PROTOTYPE.

Things used :- one ball with rod (already connected) , wooden log (small in size and weight should also be less) , needle , table , piece of paper , standardized glass (250 ml) ,black tape , bucket in which instrument is attached , fluid (water) .

To Make Instrument → Connect the wooden piece to other end of rod to which ball is connected .

Further needle should be inserted into wooden piece to get more sharper pointing edge .

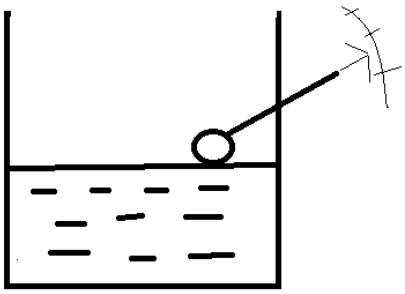
Further I inserted this instrument into bucket by making hole into bucket using heated screwdriver .

Positioned the ball in its bottom most position and that is 0 level reading , initial position.

Done with setup now we can caliberate instrument and start taking readings .

For observations I used a table which was made parallel to the plane of instrument (instrument is in one plane ,vertical) , to get exact readings . Pasted a paper on table on which we can take recordings .

DIMENSIONS

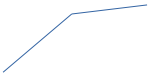


length of rod = 14 cm .

Diameter of ball = 7 cm.
Length of wooden piece (with sharp end) = 9 cm .

Length of needle = 1.5 cm .

In between link to whose either end rod and wooden piece are connected is of length = 9cm .
It also make axis of rod to be at 12-14 deg to axis of wooden piece . So its kind of like



and angle between them is 12-14 deg . To the right end needle is attached .

WORKING DEMONSTRATION

1. **Zero water level**

https://drive.google.com/file/d/1E2mI2149w4SpR-EPP5mxraap-cPnfZ90/view?usp=sharing

2. **Adding 1 litre water from standardized glass**

https://drive.google.com/file/d/1VqqN5F89LB3ZVy-iu5npIMzxdRD7JZu6/view?usp=sharing

3. **Caliberation 1 litre**

https://drive.google.com/file/d/1g-viEaXEJNKV9VOcyLO9atFsXQyF8Bm7/view?usp=sharing

4. **Caliberation 2 litres**

https://drive.google.com/file/d/1aaGmSS-HWA4EmZj2J0SVNPOFP4CSeoas/view?usp=sharing

5. **Caliberation 3 litres**

https://drive.google.com/file/d/1nBK_xsL7Q3rE2swEoYCuvDb2fAFXZ4qW/view?usp=sharing

6. **Trial measurements and Checking Instrument**

https://drive.google.com/file/d/1kcZIkMsbyhbQ_VEA_ibaAElI0NQ3HtVp/view?usp=sharing

7. **Project setup explained**

https://drive.google.com/file/d/1oGp6qm4_0vvxCRQbiBFYPjzbKRZOwV7F/view?usp=sharing

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