

University : Menoufia  
Faculty : Electronic Engineering  
Department : Industrial Electronics and  
Control Engineering  
Course Name : Applications of control systems 4

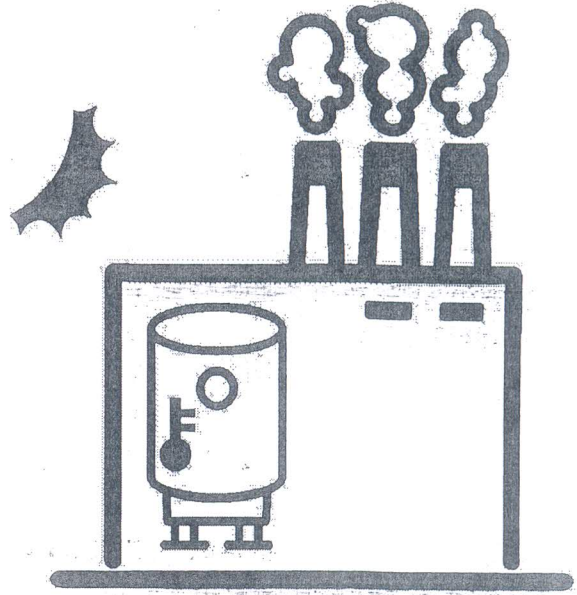


Date : 16/06/2019.  
Time : 3 Hours  
No. of pages : 1  
No. of Questions : 2  
Exam : Final

### Question No 1 : Sensors Interfacing for Chemical Factory

If you have a chemical factory with boiler tank as shown in the figure; according to your study, select the appropriate sensor and design its interfacing circuit to get its output for the following:

- A) Measure the average temperature inside the factory.
- B) Measure the temperature inside the boiler tank.
- C) Measure the weight of the tank.
- D) Measure the fluid level in the tank.
- E) Measure the water evaporation in the tank.
- F) Measure if there are any gas leakage in the factory or not.
- G) Measure if there are sunlight or not.

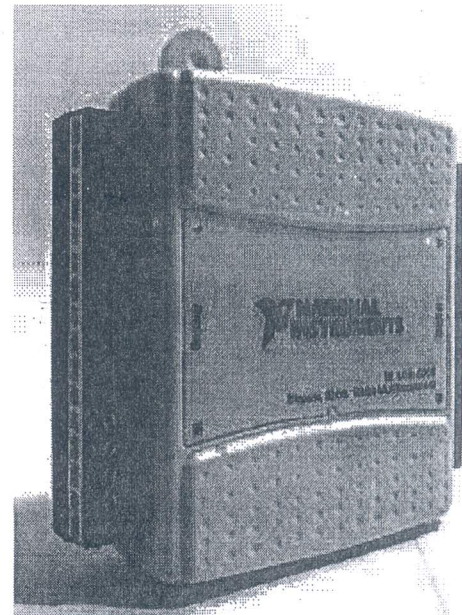


Note: you can clear your answer with any drawing you want

### Question No 2 : NI DAQ NI-USB 6009

According to your study:

- A) 1- What are the general types of NI DAQ analog modes?  
2- Explain each one.
- B) 1- How many analog inputs in this DAQ?  
2- What are its types?  
3- How many analog outputs?  
4- How many digital inputs? And outputs?
- C) Pressure sensor:  
1- draw its symbol, explain its supply, input and output  
2- how to be interfaced with this DAQ?



Best Wishes  
Dr. Ahmed El-Sherbeny