



Seat No. \_\_\_\_\_

## King Mongkut's University of Technology Thonburi

Midterm Exam of Semester 1, 2018

INC 351 Process Control and Instrumentation Drawing

3AE,3WIL,3INC

Date: Friday October 5th, 2018

13.00 – 16.00

### Instructions

This exam has 3 sections, 8 pages. Write your answers into this exam paper.

1. First section has 10 questions for 10 marks.
2. Second section has 10 question for 10 marks
3. Third section has 1 question for 10 marks.
4. Calculators according to KMUTT regulations are allowed.
5. Document and books are not allowed.
6. Write down your name and student ID on each page.
7. Students are not allowed to take examination scripts, answer booklets or any materials out of the examination room, Violation of the rule shall result in a penalty of student receiving a zero in that examination.
8. Students who are caught cheating in the examination shall be penalized by receiving Fall-grade (F) in that subject and is forced to withdraw (W) from all remaining subjects in that semester. The maximum penalty may include expulsion.

<b>I</b>	
<b>II</b>	
<b>III</b>	
<b>Σ</b>	

(Somchai Triratanajaru)

Examiner

This exam has been approved for quality by the department of Control System and Instrumentation Engineering

(Asst. Prof. Dr. Sudchai Boonto)

Head of Department

Name \_\_\_\_\_ Student ID. \_\_\_\_\_

**1. Answer the following questions. (1 mark each)**

1.1 What is the primary purpose of a Process Flow Diagram (EFD)?

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1.2 What is the correct line style for representing a digital field bus connection between instruments in the field?

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1.3 What is the correct line style for representing a pneumatic connection between instruments in the field?

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1.4 What is the standard signal range for analog current signal?

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1.5 What should be the primary source of instrumentation symbols and identification?

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1.6 Give an example of flag usage in P&I drawing.

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1.7 Who are the end users of symbols and identification? What should they be kept in mind when using symbols and identification?

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1.8 How to represent particular computer software function in P&I symbolism?

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1.9 What is the meaning of loop number followed by a letter (eg. 101A or 101B) ?

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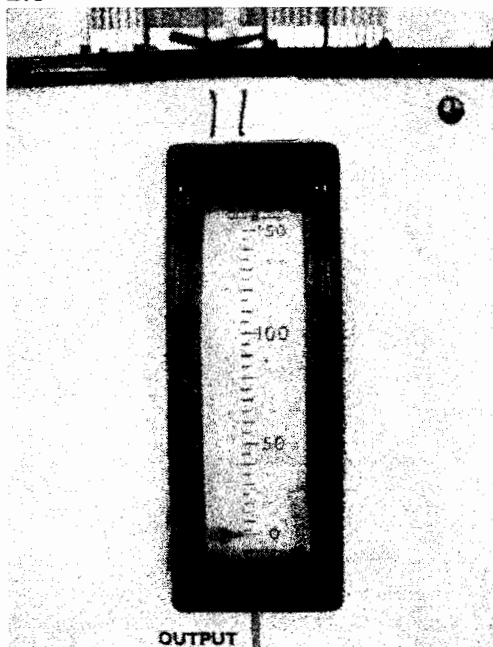
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1.10 When it is necessary to become more specific about installed location, how are the following concepts symbolized: Devices that are installed behind the local control panel?

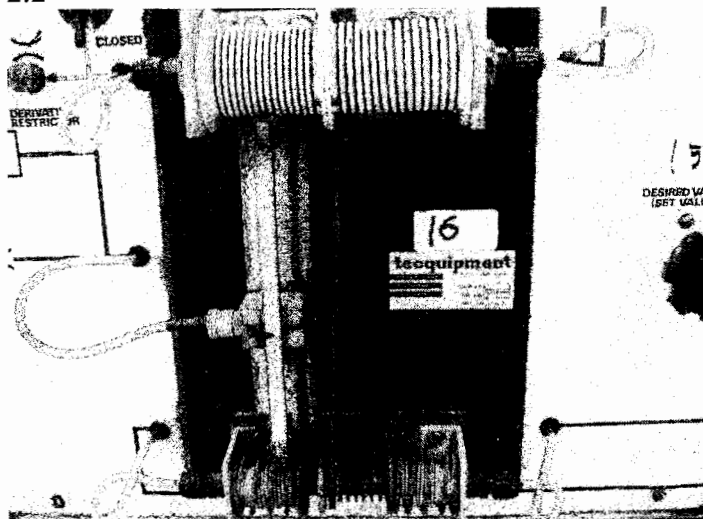
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2. What is the correct P&I symbol for each device in each picture as list below. Write down the answer on the right of each picture (1 mark each)

2.1

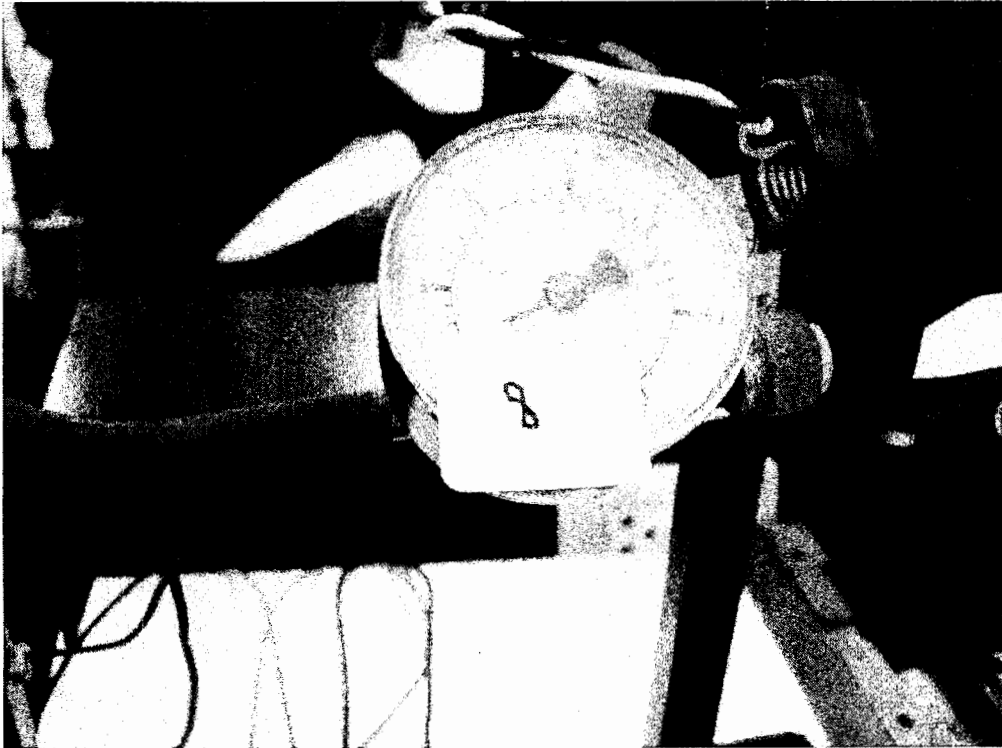


2.2

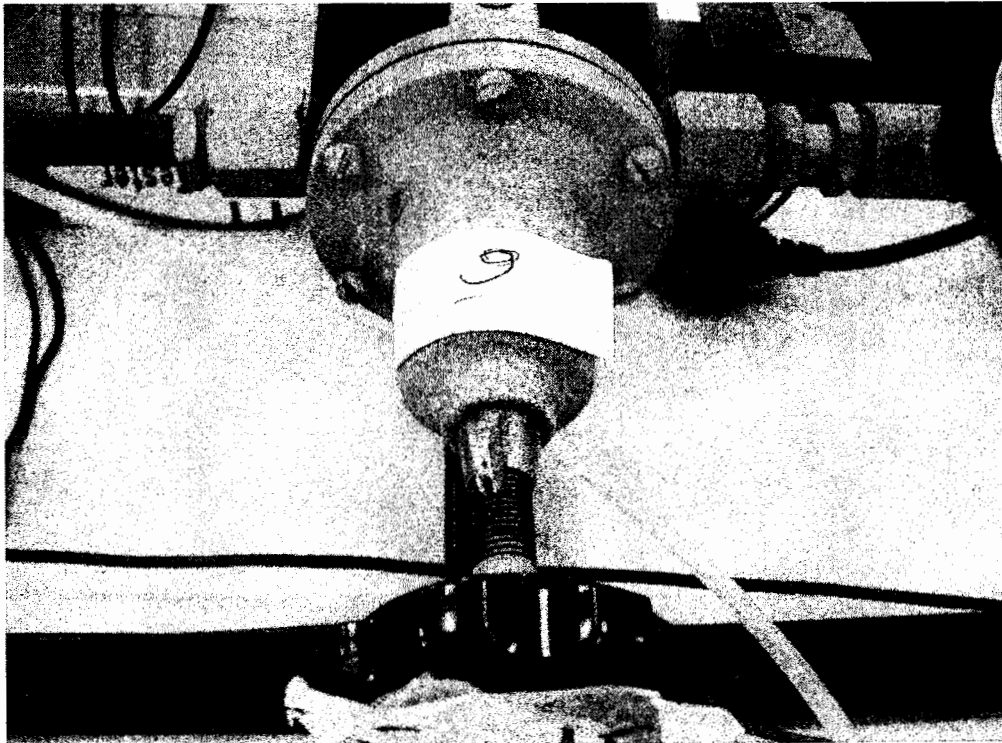


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2.3

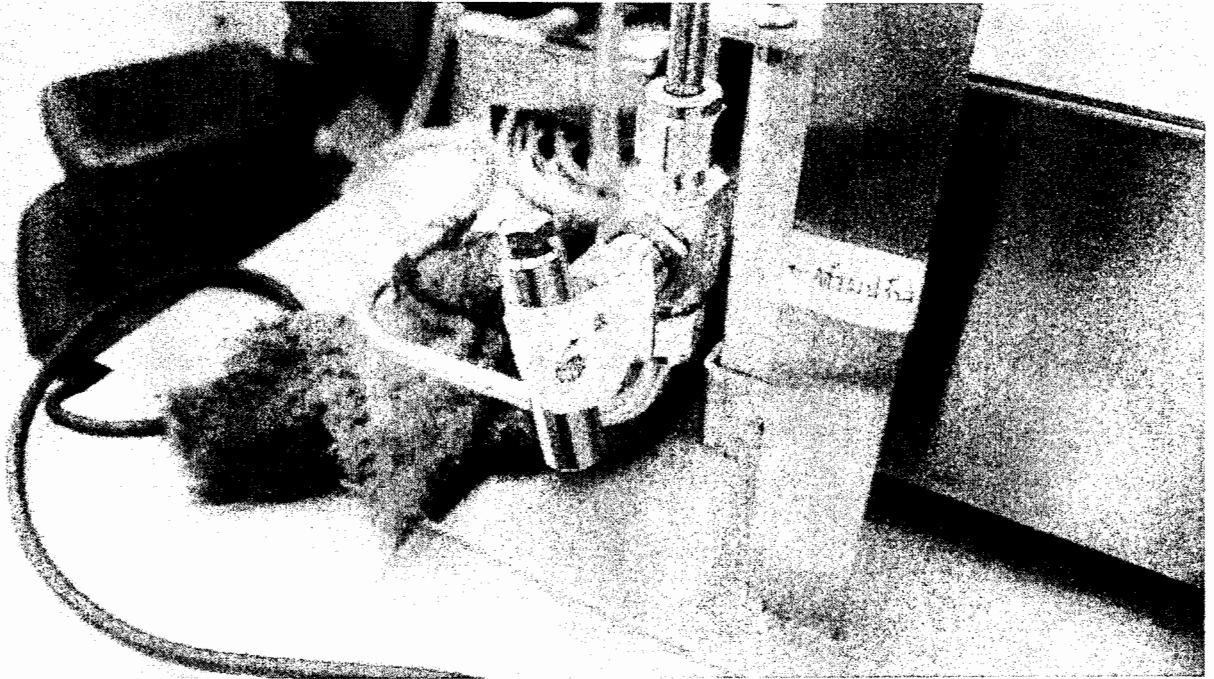


2.4

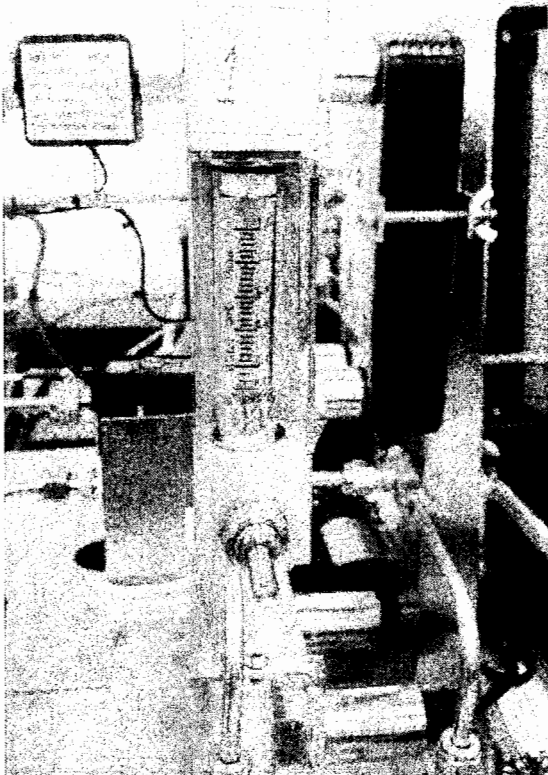


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2.5

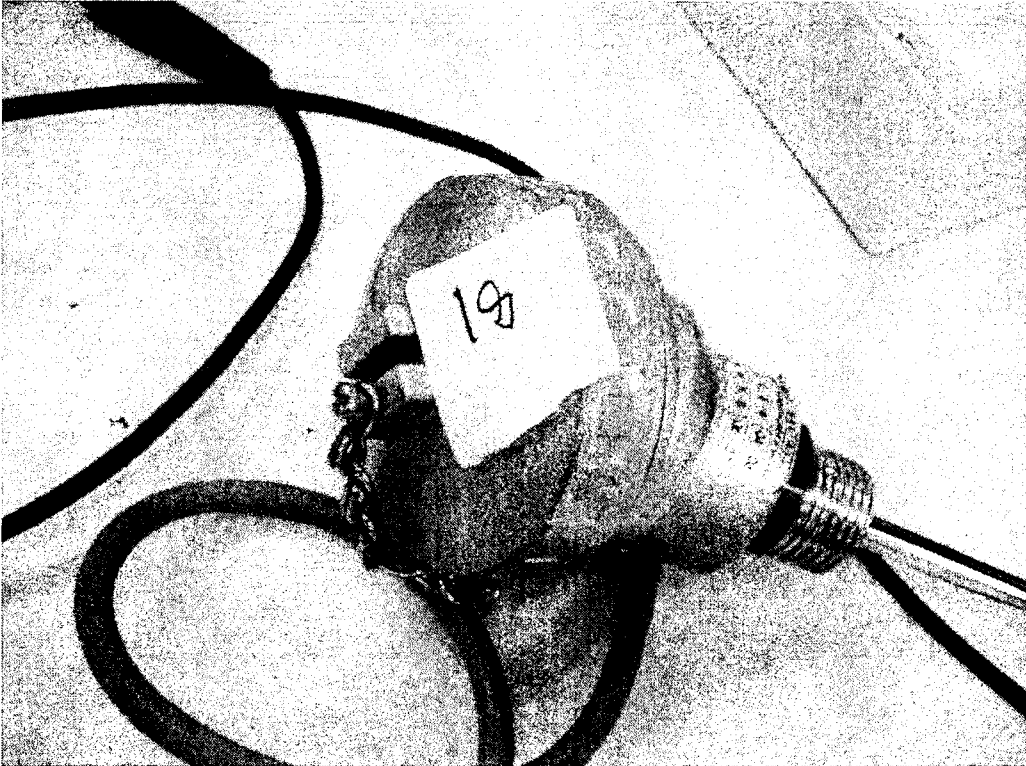


2.6

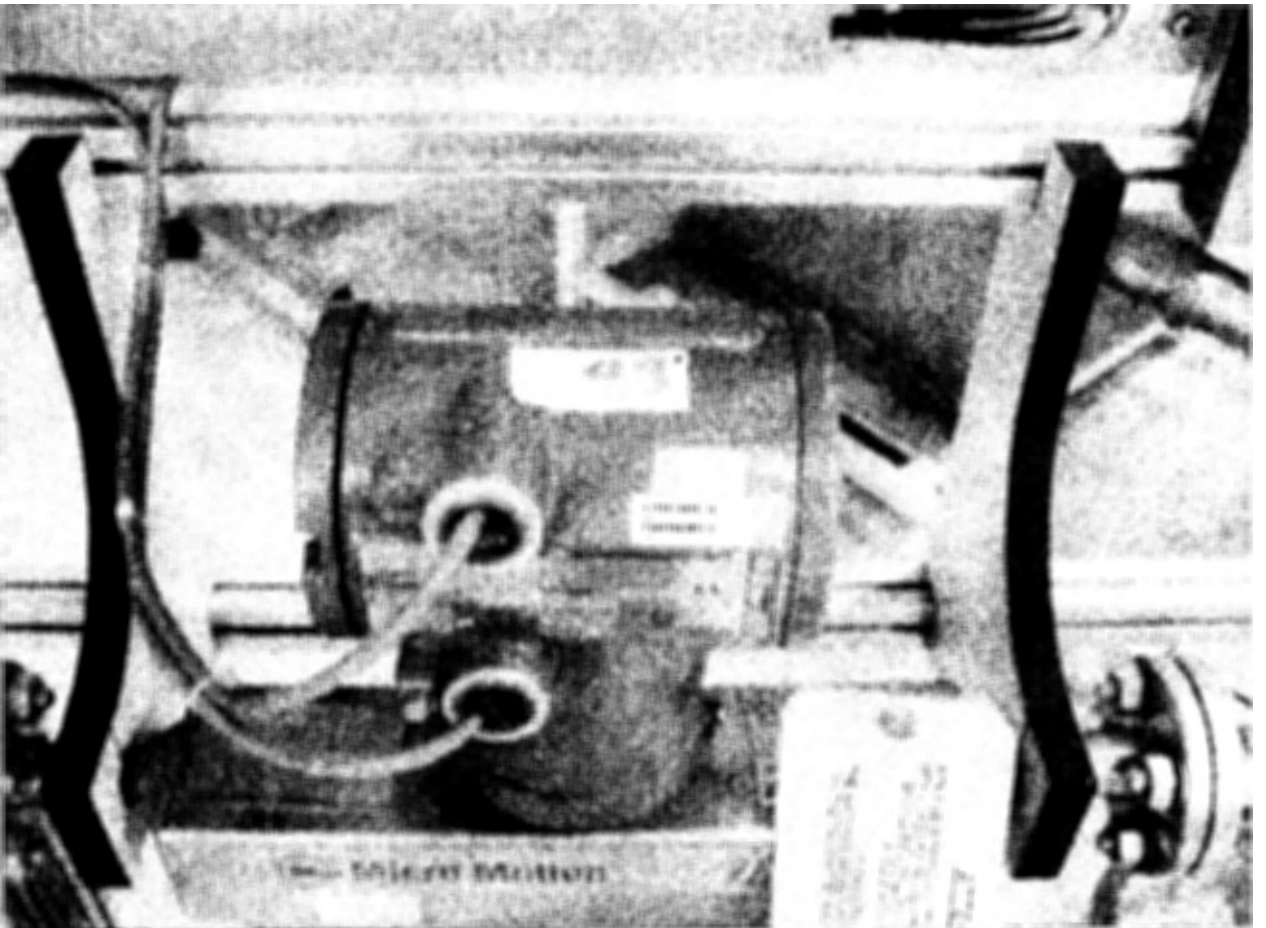


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2.7

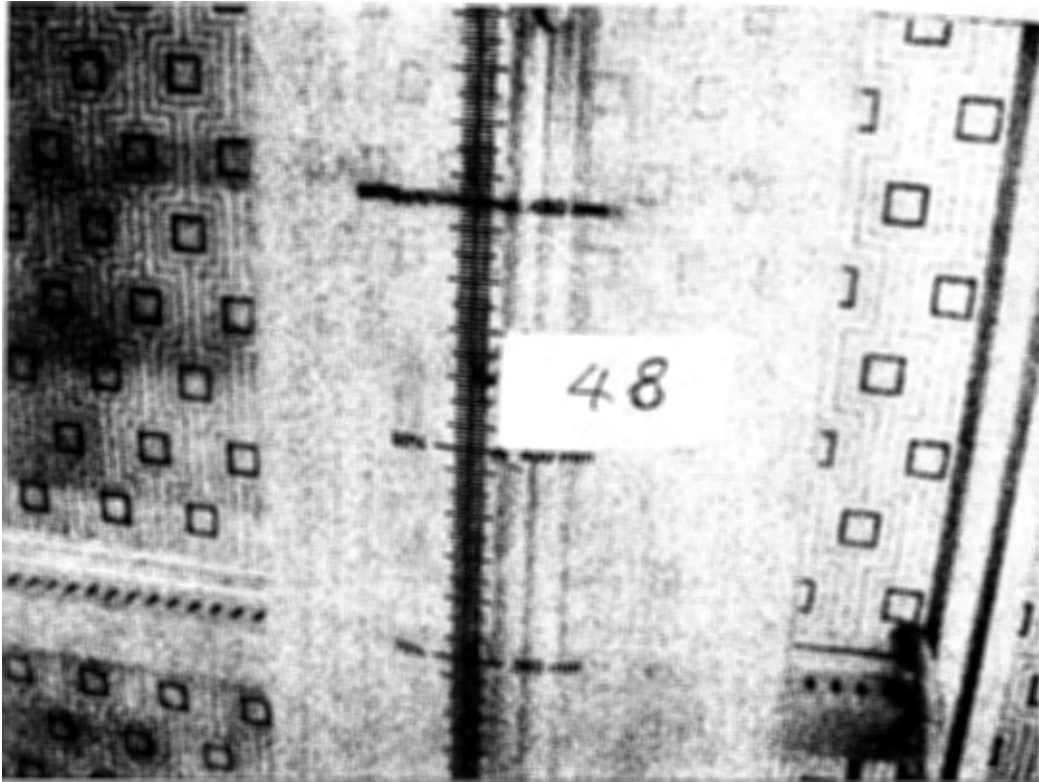


2.8

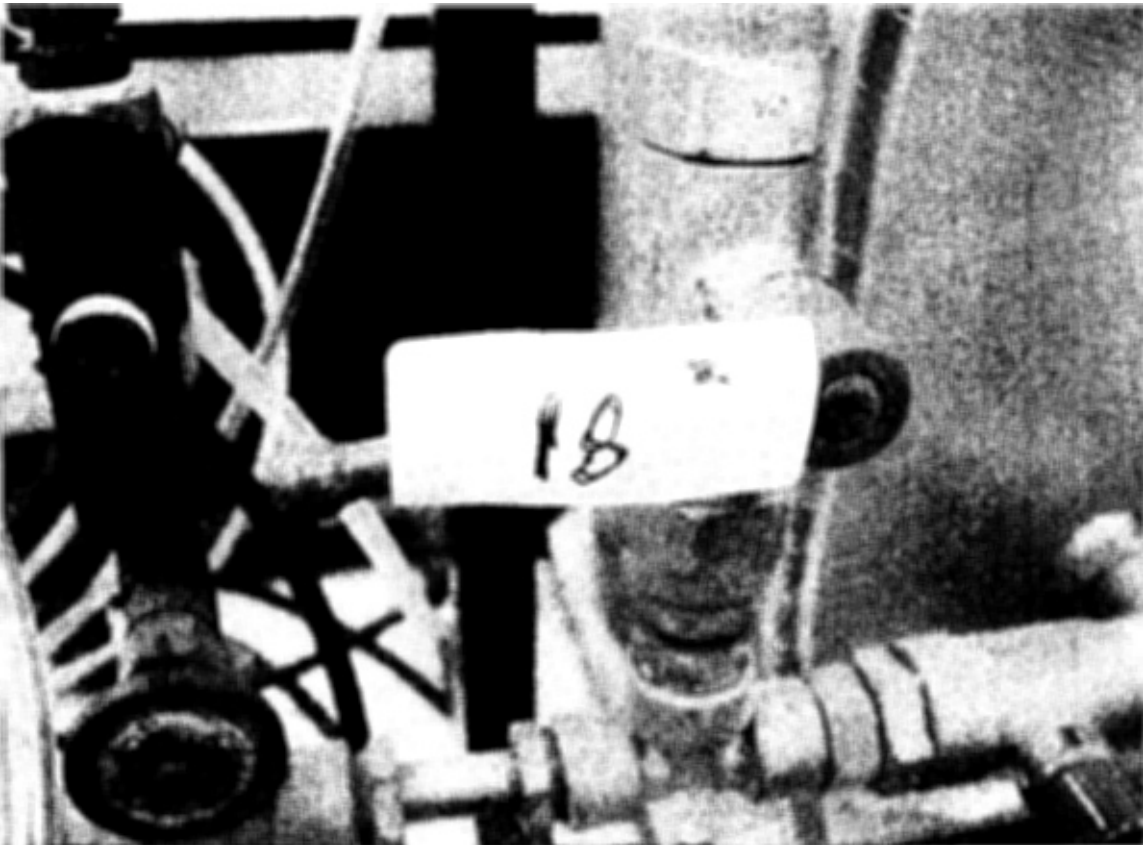


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2.9

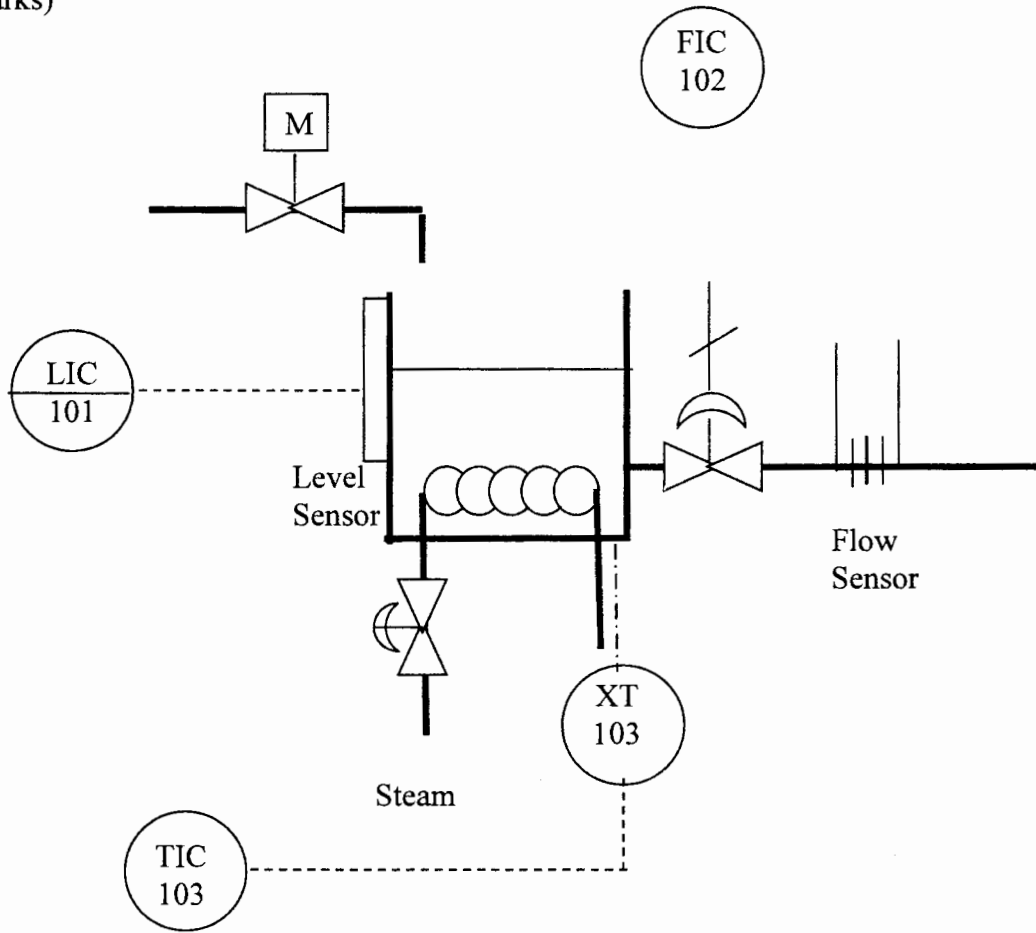


2.10



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3. There are uncompleted parts and some faults in PID diagram. Completed, identify and draw a new corrected diagram.  
(10 marks)



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