

GUJARAT TECHNOLOGICAL UNIVERSITY**B. E. - SEMESTER – VI • EXAMINATION – WINTER 2012****Subject code: 161701****Date: 02/01/2013****Subject Name: Instrumentation System****Time: 02.30 pm - 05.00 pm****Total Marks: 70****Instructions:**

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Define the following terminology used in Instrumentation System. **07**
1) P & I Diagram & it's standard 2) Instrumentation Air
3) Plant Air
- (b)** Draw the P & I diagram for Cascade process. Clearly mention process you select, control variables, sensor, FCE and controller used in your P & I diagram. **07**
- Q.2 (a)** Draw the graphical symbols as per ISA 5.1 standard **07**
1. Any four line (Not process line) 2. Any four control valve
3. Any five primary sensor (element /measuring device)
- (b)** Draw the loop wiring diagram for any analog closed loop as per standard instrumentation practice from field to control room. **07**
- OR**
- (b)** Explain and draw the installation for DP transmitter used for liquid flow measurement. Also prepare material bill for your installation need. **07**
- Q.3 (a)** What is need of compressor in Instrumentation Air System? Explain various control used in compressor of Instrumentation Air System. **07**
- (b)** List out various method used for pressure measurement. How we do the selection of appropriate method for our pressure measurement application? **07**
- OR**
- Q.3 (a)** Draw and explain large Instrumentation Air system. **07**
- (b)** List out various method used for flow measurement. How we do the selection of appropriate method for our flow measurement application? **07**
- Q.4 (a)** Discuss various control room layout criteria's we consider for design control room for gas based power plant industry. **07**
- (b)** As per your best knowledge prepare the check out procedure for temperature transmitter used for measure the temperature of compressor discharge stream(line) used in utility section of continues plant. **07**
- OR**
- Q.4 (a)** Give the various communications systems used in plant control room. Explain any two in details with its features. **07**
- Q.4 (b)** Prepare instrumentation specification sheet(ISS) for pH meter used to measure pH of DM water of utility Unit section of power plant. **07**
- Q.5 (a)** Distinguish between process flow sheet and mechanical flow sheet regarding documentation under instrument project control. Also given it's roll and significant in project control as commissioning instrumentation engineer. **07**
- (b)** Given the general consideration for specification of control valve under engineering design criteria. **07**
- OR**
- Q.5 (a)** Explain in details the duties and jobs of project manager and project engineer regarding instrumentation project control. **07**
- (b)** What you mean by electric safety in Engineering design criteria. Explain national electric code(NEC) safety standard. **07**
