

GUJARAT TECHNOLOGICAL UNIVERSITY
DIPLOMA ENGINEERING -V SEMESTER – EXAMINATION – WINTER-2014

Subject Code:3351701**Date: 01/05/2014****Subject Name: Electronic & Pneumatic Instrumentation****Time: 2:30 pm to 5:00 pm****Total Marks: 70****Instructions:**

1. **Attempt all questions.**
2. **Make Suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Use of programmable & Communication aids are strictly prohibited.**
5. **Use of only simple calculator is permitted in Mathematics.**
6. **English version is authentic.**

- Q.1** Answer any seven out of ten. **14**
1. List any two characteristics of current transformer.
 2. List any two characteristics of potential transformer.
 3. Draw neat diagram of force balance type electronic transmitter.
 4. Draw neat diagram of motion balance type electronic transmitter.
 5. State the need for pilot relay.
 6. Draw neat schematic diagram of self balancing instrument.
 7. State the need for standardization of signals.
 8. Classify measurement bridges and list one type of each.
 9. State mathematical expression for P control action and I control action.
 10. Draw the circuit diagram for op amp based differentiator.
- Q.2** (a) Define proportional band. Write the equation showing relation between gain and proportional band. **03**
- OR
- (a) Draw output response of P, I and D controller for step input. **03**
- (b) Explain motion balance principle with schematic diagram. **03**
- OR
- (b) Explain force balance principle with schematic diagram. **03**
- (c) Describe construction of voltage to current converter with diagram. **04**
- OR
- (c) With the help of diagram, describe construction of ac to dc converter for mA. **04**
- (d) Describe the working of resistance to voltage converter with neat diagram. **04**
- OR
- (d) Describe the working of resistance to current converter with neat diagram. **04**
- Q.3** (a) Draw neat and clean Block diagram for standard signal generator. **03**
- OR
- (a) Describe working principle of PMMC type instrument with neat diagram. **03**
- (b) Explain the operation of standard signal generator in detail. **03**
- OR
- (b) Describe the function of instrumentation amplifier in detail. **03**
- (c) Draw neat and clean Block diagram of CRO. **04**
- OR
- (c) Describe construction of pressure regulator with neat sketch. **04**

- (d) Explain operation of pneumatic proportional controller with neat sketch. **04**
 OR
 (d) Explain operation of op amp based circuit for electronic P+I+D controller. **04**
- Q.4** (a) Draw and explain basic block diagram of smart transmitter. **03**
 OR
 (a) State the features of an intelligent transmitter. **03**
 (b) Describe construction of force balance type pneumatic transmitter. **04**
 OR
 (b) Describe construction of motion balance type pneumatic transmitter. **04**
 (c) Explain the working of electronic to pneumatic (I/P) converter with the help of schematic diagram. **07**
- Q.5** (a) Compare electronic and pneumatic instruments. **04**
 (b) Discuss importance of isolation. **04**
 (c) Justify the need for transmitters. **03**
 (d) Enlist components of self balancing instruments. **03**
