

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

Enrolment No.: \_\_\_\_\_

## GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA ENGINEERING – SEMESTER – V (NEW) • EXAMINATION – SUMMER - 2018

Subject Code: 3351701

Date: 12-May-2018

Subject Name: Electronic & Pneumatic Instrumentation

Time: 02:30 PM To 05:00 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. Draw output response of proportional controller for pulse input.
  2. Draw output response of integral controller for pulse input.
  3. Draw output response of derivative controller for pulse input.
  4. Draw circuit diagram of voltage to current convertor.
  5. State the need for pilot relay.
  6. State standard unit and range for electronic signal used in instrumentation.
  7. State standard unit and range for pneumatic signal used in instrumentation.
  8. List out controller tuning method.
  9. List electronic instrument based on laboratory instruments.
  10. State mathematical expression for electronic proportional control action.
- Q.2** (a.i) Draw block diagram of C.R.O. **03**
- Q.2** (a.ii) Explain working of C.R.O. **04**
- OR
- Q.2** (a.i) Why standardization of signal is required? **03**
- Q.2** (a.ii) Compare electronic and pneumatic instruments. **04**
- Q.2** (b.i) Draw constructional diagram of moving iron type instrument. **03**
- Q.2** (b.ii) Explain working of moving iron type instrument. **04**
- OR
- Q.2** (b.i) Draw Maxwell bridge and write final equation to find out unknown capacitance. **03**

<b>Q.2</b>	(b.ii)	Discuss importance of isolation.	<b>04</b>
<b>Q.3</b>	(a.i)	Draw motion balance type pneumatic transmitter	<b>03</b>
<b>Q.3</b>	(a.ii)	Explain motion balance type pneumatic transmitter.	<b>04</b>
<b>OR</b>			
<b>Q.3</b>	(a.i)	Draw construction of pneumatic proportional + integral + derivative controller.	<b>03</b>
<b>Q.3</b>	(a.ii)	Describe force balance principle with schematic diagram.	<b>04</b>
<b>Q.3</b>	(b.i)	Draw force balance type electronic transmitter	<b>03</b>
<b>Q.3</b>	(b.ii)	Explain force balance type electronic transmitter.	<b>04</b>
<b>OR</b>			
<b>Q.3</b>	(b.i)	Draw construction of pneumatic proportional + derivative controller.	<b>03</b>
<b>Q.3</b>	(b.ii)	Explain operation of op amp based circuit for electronic P+I+D controller.	<b>04</b>
<b>Q.4</b>	(a.i)	Define proportional band. Write the equation showing relation between gain and proportional band.	<b>03</b>
	(a.ii)	With the help of diagram, describe construction of ac to dc converter for mA.	<b>04</b>
<b>OR</b>			
<b>Q.4</b>	(a.i)	State the features of an intelligent transmitter.	<b>03</b>
	(a.ii)	Explain the operation of current transformer with the schematic diagram.	<b>04</b>
<b>Q.4</b>	(b)	Explain the working of electronic to pneumatic (I/P) converter with the help of schematic diagram.	<b>07</b>
<b>Q.5</b>	(a)	Draw circuit diagram of electronic integral controller and write mathematical expression for it.	<b>04</b>
<b>Q.5</b>	(b)	Describe flapper nozzle mechanism.	<b>04</b>
<b>Q.5</b>	(c)	Draw pneumatic proportional controller.	<b>03</b>
<b>Q.5</b>	(d)	Draw circuit diagram of Wheatstone Bridge and write equation to find out unknown resistance.	<b>03</b>

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