

Code No: RT41025

**R13**

**Set No. 1**

IV B.Tech I Semester Supplementary Examinations, February/March - 2018

**INSTRUMENTATION**

(Open Elective)

Time: 3 hours

Max. Marks: 70

*Question paper consists of Part-A and Part-B*

*Answer ALL sub questions from Part-A*

*Answer any THREE questions from Part-B*

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**PART-A** (22 Marks)

1. a) List out the static characteristics of an instrument. [3]
- b) What are the various types of transducers? [4]
- c) Define gauge sensitivity [4]
- d) What are the specifications of digital voltmeters? [4]
- e) What is the function of phosphor screen in CRO? [4]
- f) What is a Q meter? Discuss [3]

**PART-B** (3x16 = 48 Marks)

2. a) What is pulse code modulation? Give an example? [8]
- b) The current through a resistor is 5A, but the measurement yields a value of 4.9A. Calculate the absolute error and the percentage error of the measurement. [8]
3. a) Discuss in detail about the advantages of electrical transducers [8]
- b) A certain crystal has a coupling coefficient of 0.32. How much electrical energy must be applied to produce an output of 1 oz.in. of mechanical energy. [8]
4. a) Explain in detail about the advantages and disadvantages of turbine flowmeter. [8]
- b) Discuss in detail about various methods of measuring angular velocity. [8]
5. a) Explain the advantages and disadvantages of microprocessor based ramp type digital voltmeters. [8]
- b) A 3 ½ digital voltmeter is used for measuring voltage. Find the resolution of the instrument. How would a voltage of 14.42 be displaced on 10 V range? How would be a reading 14.42 be displaced on 100 V range? [8]
6. a) Draw various lissajous patterns and explain their significance. [8]
- b) A CRO with a sensitivity of 5 V/cm is used. AC voltages of different magnitudes are applied to the y-input each time. Determine the AC voltages if the length of the straight lines observed are (i) 5 cm (ii) 12 cm [8]
7. a) Discuss about various types of Harmonic distortion analyzers. [8]
- b) Discuss in detail about the operation of RMS voltmeters in detail. [8]