

Code No: **RT41025****R13****Set No. 1****IV B.Tech I Semester Supplementary Examinations, March - 2017****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*

PART-A (22 Marks)

1. a) What are the properties of modulated signals? [3]
- b) Define transducer? [3]
- c) Write the differences between force and torque? [4]
- d) List out various types of digital voltmeters? [4]
- e) What is meant by time base generator? [4]
- f) What is meant by total harmonic distortion? [4]

PART-B (3x16 = 48 Marks)

2. a) What are the various sources of gross, systematic and random errors in the measuring instruments? How those errors are minimized? [8]
- b) Write the differences between periodic and aperiodic signals? [8]
3. a) Explain about the applications of thermo couples? [8]
- b) What are the various advantages of electrical transducers? [8]
4. a) Explain about Hooke's law by using necessary relations? [8]
- b) The resistance of a strain gauge is 120 ohms and its gauge factor is 2. It is connected to a current sensitive wheat stone bridge in which all resistances are 120 ohms. If the input voltage is 4V and the resistance of the galvanometer is 100 ohms, calculate the detector current in micro amperes for one micro strain. Also determine the voltage output if one micro strain is applied to the gauge and the voltmeter has infinite input impedance? [8]
5. a) Explain how frequency is measured by digital meter and write its advantages? [8]
- b) Explain how phase angle is measured by digital meter and write its advantages? [8]
6. a) Explain about the role of horizontal amplifier and vertical amplifiers in the operation of a cathode ray oscilloscope? [8]
- b) Discuss in detail about the applications and advantages of cathode ray oscilloscope? [8]
7. a) Explain the operation of RMS voltmeters? [8]
- b) Discuss in detail about the operation of Q- meter with neat diagram? [8]