Code No: **RT41025**   **R13**   Set No. 1

IV B.Tech I Semester Supplementary Examinations, February - 2019
INSTRUMENTATION
(Common to Electrical and Electronics Engineering and Mechanical Engineering)

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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<u>PART–A</u> *(22 Marks)*

1. a) List out the dynamic characteristics of an instrument.   [3]
    b) What are the properties of a passive transducer?   [4]
    c) How strain can be measured?   [3]
    d) What are the performance characteristics of digital voltmeters?   [4]
    e) What is the function of vertical deflection plate in CRO?   [4]
    f) Discuss the applications of Wave analyzers.   [4]

<u>PART–B</u> *(3x16 = 48 Marks)*

2. a) Classify the different types of signals and explain them with an example of each.   [8]
    b) The value of a resistance is 5 kΩ, while measurements yield a value of 4.91 kΩ
        calculate (i) relative accuracy of measurement (ii) percentage accuracy.   [8]

3. a) Explain in detail about the factors to be considered while selecting a transducer.   [8]
    b) Discuss in detail about the advantages and limitations of Thermistor.   [8]

4. a) Explain in detail about the advantages and disadvantages of magnetic flow meter.   [8]
    b) Explain in detail about the principles used in torque measuring transducers.   [8]

5. a) With the help of a block diagram, explain the operation of a microprocessor
        based ramp type digital voltmeter.   [8]
    b) A 3 ½ digital voltmeter has an accuracy of ±0.5 % of reading ±1 digit. What is
        the possible error in volts when the instrument is reading 4 V on the 10 V range?
        What is the possible error in volts while reading 0.12 V on the 10 V range?   [8]

6. a) Draw the block diagram of sampling oscilloscope and explain the working.   [8]
    b) The Lissajous pattern on a CRO is stationary and has five horizontal and two
        vertical tangencies. The frequency of horizontal input is 600 Hz. Determine the
        frequency of vertical input and draw the pattern.   [8]

7. a) Explain the operation of Heterodyne Wave analyzer with the help of its block   [8]
        diagram.
    b) Discuss in detail about Peak reading voltmeters along with its significance.   [8]