Code No: **R164102D** **R16** **Set No. 1**

IV B.Tech I Semester Regular/Supplementary Examinations, Jan/Feb - 2022

INSTRUMENTATION

(Electrical and Electronics 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 FOUR questions from Part-B
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PART–A *(14 Marks)*

1. a) What is meant by modulating signal? [2]
   b) Enumerate advantages of electrical transducers. [2]
   c) Write the limitations of electromagnetic flow meter. [2]
   d) What are the types of digital voltmeters? [2]
   e) What are the major components of a CRT? [3]
   f) List out the engineering applications of wave analyzer. [3]

PART–B *(4x14 = 56 Marks)*

2. a) Distinguish between systematic and random errors in a measurement and how they are usually minimized. [7]
   b) Explain about the static characteristics of an instrument. [7]

3. a) What is meant by synchros? Explain the working of synchros with neat sketch. [7]
   b) An LVDT is employed for measuring the deflection of a bellows. The sensitivity of the LVDT is 60 V/mm. The bellows is deflected by 0.15 mm by a pressure of $1.2\times10^6 N/m^2$. Determine the sensitivity of the LVDT in V per N/m^2 and the pressure when the output voltage is 4.5 V. [7]

4. a) What are the devices used for liquid level measurements? Explain any one method. [7]
   b) Discuss about the pressure measurement using resistive transducers. [7]

5. a) Explain the working of digital phase angle meter with neat sketch. [7]
   b) State the advantages of a digital voltmeter over an analog meter. [7]

6. a) Discuss with neat block diagram of vertical amplifier. [7]
   b) Explain the working of sampling oscilloscope with neat sketch. [7]

7. a) Explain the operation of a vector impedance meter with the help of a block diagram. [7]
   b) Discuss the working of peak reading and RMS voltmeters. [7]