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

IV B.Tech I Semester Supplementary Examinations, February- 2020

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) Define the term Calibration and give its significance in an instrument. [3]
   b) Distinguish between Active transducers and passive transducers. [2]
   c) What are "manometers"? how are these classified. [3]
   d) List the advantages of Digital Instruments. [2]
   e) Explain the significance of Sweep generator in CRO. [2]
   f) Distinguish between Wave Analyzer and Spectrum Analyzer. [2]

PART–B *(4x14 = 56 Marks)*

2. a) Explain the Dynamic characteristics of a measuring System and give its significance. [7]
   b) Explain the process of modulation and the techniques usually adopted. [7]

3. a) List the properties of Strain gauge materials. Explain the term Gauge factor and give its significance. [7]
   b) Explain the working and practical set-up of a pair of synchros. [7]

4. a) Explain briefly the construction and working of a thermocouple vacuum gauge. State its advantages and disadvantages. [7]
   b) A strain gauge is bonded to a beam which is 12 cm long and has a cross sectional area of 3.8 cm^2. The unstrained resistance and gauge factor of the strain gauge are 220 Ω and 2.2 respectively. On the application of load the resistance of the gauge changes by 0.015 Ω. If the modulus of elasticity for steel is 207 GN/m^2, calculate: i) The change in length of the steel beam. ii)The amount of force applied to the beam [7]

5. a) Explain the working of Digital Frequency meter with a neat block diagram. [7]
   b) Explain the working of Ramp type Digital voltmeter with a neat block diagram. [7]

6. a) Explain the working and significance of Cathode ray tube. [7]
   b) Explain how Phase angles can be measured by using a CRO. [7]

7. Discuss about the following:
   i) Vector impedance meter ii) Q- Meter. [14]

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