

IV B.Tech II Semester Supplementary Examinations, July/August - 2017
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(Electronics and Communication 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

PART-A (22 Marks)

1. a) What are the indications of precision? Explain [3]
- b) What is Digital Fourier analyzer? Explain [3]
- c) Draw the vertical amplifier of CRO and what are its functions [4]
- d) What are the applications and limitations of Wheatstone bridge [4]
- e) How do you select a transducer? Explain [4]
- f) What are the objectives of a DAS [4]

PART-B (3x16 = 48 Marks)

2. a) Discuss in detail about the range extension of differential voltmeters [8]
- b) A 200 Ω basic movement is to be used as an ohmmeter requiring full scale deflection of 1 mA and internal battery voltage of 5 V. A half scale deflection marking of 2 k is desired. Calculate
 - i. The values of R_1 and R_2
 - ii. Maximum value of R to compensate for a 3% drop in battery voltage [8]
3. a) Draw the block diagram of a spectrum analyzer and explain its working. [8]
- b) Draw and explain the working principle of harmonic distortion analyzer. [8]
4. a) What are active probes used with CRO? Draw the circuit of a FET probe and explain [8]
- b) Draw the circuit diagram of a simple compensated attenuator and explain its working [8]
5. a) Illustrate the method of measurement of unknown inductance by Maxwell's bridge [8]
- b) A sheet of 4.5 mm thick Bakelite is tested at 50 Hz between 12 cm in diameter. The Schering bridge uses a standard air capacitor C_2 of 105 pF capacitor, a non-reactive, R_4 of 1000 Ω in parallel with a variable capacitor and is obtained with $C_4 = 0.5 \mu\text{F}$ and $R_3 = 260 \Omega$. Calculate the capacitance, PF and relative permittivity of the sheet [8]
6. a) Draw the construction diagram and explain the working of LVDT [8]
- b) What is a thermistor? Explain. Write about its advantages and disadvantages [8]
7. Write short notes on the following
 - a) Measurement of force
 - b) Multi channel DAS [16]