

# School of Electrical Electronics and Communication Engineering

Electrical Engineering  
ETE - Jun 2023

Time : 3 Hours

Marks : 100

## Sem IV - G2UB405C - Electrical Measurement and Instrumentation

Your answer should be specific to the question asked

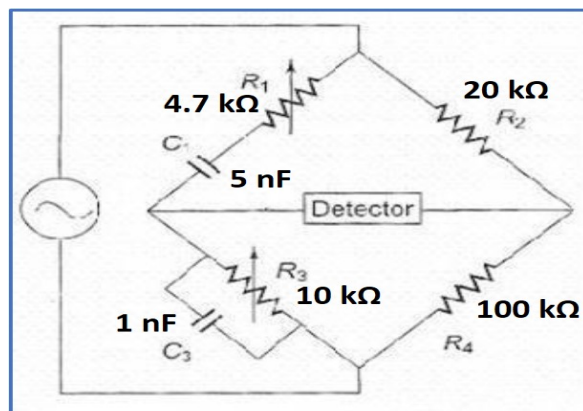
Draw neat labeled diagrams wherever necessary

1. Distinguish between accuracy and precision of a measuring instrument K2 CO2 (5)
2. Define secondary type of measurement instrument and classify it K1 CO1 (5)
3. A current of 100 A was measured by an ammeter and the values are indicated as 100.3 A, 100.4 A and 100.5 A. What is the precision of the ammeter? K2 CO3 (5)
4. Describe how to measure capacitance using Schering bridge K3 CO2 (10)
5. Explain working principle of three phase wattmeter with the circuit diagram K3 CO3 (10)
6. Illustrate speed of response, fidelity, lag and dynamic error in a measuring instrument K2 CO1 (10)
7. PMMC instrument of an ammeter is with a coil of 99 ohm resistance and FSD = 0.1 mA. Shunt resistance is with the value of 1  $\Omega$ . Compute the value of ammeter current at (a) FSD and (b) 0.5 FSD K4 CO4 (10)

OR

An PMMC instrument has coil dimension 15 mmx12 mm. Flux density is 1.8 bWb/m<sup>2</sup>. Spring constant= $0.14 \times 10^{-6}$  Nm/rad. Find number of turns if 5 mA current produces 90° of deflection K4 CO4 (10)

8. Explain working principle of PMMC instrument and derive expression of torque for the same. K5 CO3 (15)
9. Derive expression of frequency for Wein's bridge. Determine the frequency of a Wein's bridge circuit as shown in the following figure K4 CO2 (15)



10. Define Q factor. Illustrate working principle of Q meter and its different applications. K5 CO4 (15)

OR

Justify the term "double bridge" in Kelvin double bridge instrument. Describe the use of Kelvin double bridge to provide practical solution for the measurement of very low value of resistance. K5 CO4 (15)