

International Islamic University Chittagong (IIUC)
Department of Electronic and Telecommunication Engineering
Midterm Exam

Program: B.Sc (Engg.)
 Course Code: ETE-3645
 Total Marks: 30

Semester: Spring 2023
 Course Title: Electronic Measurement & Instrumentation
 Time: 1.5Hours

[(i) Answer all the questions. The figures in the right-hand margin indicate full marks.]

[(ii) Course Learning Outcomes (COs) and Bloom's Levels are mentioned in additional Columns.]

Course Outcomes (COs) of the Questions						
CLO1	Apply theoretical knowledge, techniques and relevant tools to the analysis, design and testing of modern engineering issues.					
CLO2	Understand the performance characteristics and co-relation of different physical parameters with measuring instruments.					
CLO3	Analyze and interpret data after performing experiments and determine various types of errors in measurements.					
Bloom's Levels of the Questions						
Letter Symbols	R	U	Ap	An	E	C
Meaning	Remember	Understand	Apply	Analyze	Evaluate	Create

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|-----|-----|--|----|---------------|-------|
| Q1. | (a) | Explain the terms Measurement & Instrumentation. Write the types of Error in Measurement. | 04 | CLO1/
CLO3 | R/An |
| | (b) | Distinguish between deflection & null type of instrument giving suitable example. | 02 | CLO2 | An |
| | (c) | The solution for the unknown resistance for wheatstone bridge is $R_x = R_2 R_3 / R_1$, $R_1 = 100 \pm 0.5\% \Omega$, $R_2 = 1000 \pm 0.5\% \Omega$, $R_3 = 842 \pm 0.5\% \Omega$. Determine the magnitude of the unknown resistance and limiting error in percent and in ohm for the unknown resistance R_x . | 04 | CLO2 | Ap |
| Q2. | (a) | Effect of temperature change in ammeter & voltmeter. | 4 | CLO3 | An |
| | (b) | Describe the construction of PMMC Instrument. | 6 | CLO2 | U, An |
| OR | | | | | |
| Q2. | (a) | Design a multi-range d.c milli-ammeter using a basic movement with an internal resistance $R_m = 50\Omega$ and a full scale deflection current $I_m = 1\text{mA}$. The ranges required are 0-10 mA, 0-50mA, 0-100mA and a-500mA. | 04 | CLO3 | E, Ap |
| | (b) | What is Ayrton shunt. | 02 | CLO2 | R |
| | (c) | Write Advantage & Disadvantages of PMMC Instrument. | 04 | CLO2/
CLO3 | U, An |
| Q3. | (a) | Describe the measurement of power at radio frequencies. | 04 | CLO2 | An |
| | (b) | Construct the operation of vector voltmeter with the help of block diagram and list its application. | 06 | CLO3 | E |