DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Winter Examination – 2022

Course: B. Tech **Branch : Electrical Engineering** **Semester : III**

Subject Code & Name: BTEEC303 Electrical & Electronics Measurement

Max Marks: 60 **Date:** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	**State and explain the types of errors**	**L-2/CO 1**	**6**
B)	**Discuss importance of Calibration in Measurement.**	**L-2/CO 1**	**6**
C)	**Describe the following terms. (i) Precision (ii) Drift (iii) Resolution**	**L-2/CO 1**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	**Describe the working principle of single phase induction type energy meter.**	**L-2/CO 2**	**6**
B)	**What is difference between PMMC & MI Instruments?**	**L-2/CO 2**	**6**
C)	**Write short note on CT and PT**	**L-2/CO 2**	**6**
Q. 3	**Solve Any Two of the following.**		**12**
A)	**With neat sketch explain the construction and working of megger**	**L-2/CO 2**	**6**
B)	**Explain the method of measuring medium resistance with neat diagram and equation of Wheatstone bridge at balance.**	**L-2/CO 2**	**6**
C)	**Explain the method of measuring low resistance with neat diagram and equation of Kelvin's Double bridge at balance.**	**L-2/CO 2**	**6**
Q.4	**Solve Any Two of the following.**		**12**
A)	**Draw a block diagram of CRO and Explain the function of each block.**	**L-2/CO 2**	**6**
B)	**What is difference between Digital & Analog Instruments ?**	**L-2/CO 2**	**6**
C)	**Draw a block diagram of DVM and Explain the function of each block.**	**L-2/CO 2**	**6**
Q. 5	**Solve Any Two of the following.**		**12**
A)	**Explain the selection criteria for the transducers**	**L-2/CO 3**	**6**
B)	**Write short note on LVDT.**	**L-2/CO 3**	**6**
C)	**Explain working of Strip Chart Recorder.**	**L-2/CO 3**	**6**

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular/Supplementary Winter Examination – 2024

Course: B.Tech **Branch : Electrical Engineering / Electrical Engineering (Electronics and Power)/ Electrical & Electronics Engg. / Electrical & Power**

Subject Code & Name: BTEEC303 Electrical and Electronics Measurement

Max Marks: 60 **Date:10/02/2025** **Semester: III** **Duration: 3 Hr.**

Instructions to the Students:

1. *Each question carries 12 marks.*
2. *Question No. 1 will be compulsory and include objective-type questions.*
3. *Candidates are required to attempt any four questions from Question No. 2 to Question No. 6.*
4. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
5. *Use of non-programmable scientific calculators is allowed.*
6. *Assume suitable data wherever necessary and mention it clearly.*

Q. 1 Objective type questions. (Compulsory Question) Level/CO Marks **12**

1 smallest change in a measured variable to which an instrument will respond is: 1

a) Accuracy b) Resolution c) precision d) drift

2 The difference between the indicated value and the true value of a quantity is : 1

a) gross error b) dynamic error c) absolute error d) relative error

3 If the instrument has square law response, it can be used for the instrument of: 1

a) DC voltage only b) AC voltage & current c) Both AC and DC quantities d) Resistance only

4 The primary current in CT is detected by: 1

a) Secondary burden b) core of transformer c) load current d) none of the above

5 The Wheatstone bridge method of resistance measurement is ideally suitable for the Measurement 1

a) 0.001 Ω to 1 Ω b) 0.1 Ω 100 Ω c)100 Ω to 10 KΩ d) 100 kΩ to 10 MΩ.

6 Schering bridge can be used to measure which one of the followings: 1

a) Inductance b) Resistance c) Capacitance d) Power

7 Which bridge measures self-inductance using a standard capacitor? 1

a) Maxwell bridge b) Schering bridge c) Anderson bridge d) Wien bridge

8 A digital storage oscilloscope (DSO) is used to ... 1

a) Generate sinusoidal signals | b) Measure instantaneous power | c) Store and analyze waveforms digitally | d) Measure electrical resistance

9 Which transducer is commonly used for temperature measurement? 1

a) RVDT | b) Thermocouple | c) LVDT | d) Strain gauge

10 Which of the following is NOT a type of transducer? 1

a) Thermistor | b) LVDT | c) Hall effect sensor | d) Oscilloscope

11 Which characteristic is crucial for selecting a transducer? 1

a) Durability | b) Sensitivity | c) Size | d) Cost

12 Signal conditioning is essential for: 1

a) Direct data transmission | b) Converting raw signals into a usable format | c) Measuring mechanical stress | d) Storing large amounts of data

Q. 2 Solve the following. **12**

A) Define error. Explain the different types of errors with example. **CO1** **6**

B) Describe the characteristics of instruments & measurement system. **CO2** **6**

Q. 3 Solve the following. **12**

A) Draw a neat sketch of PMMC instrument and derive the equation and explain in detail? **CO1** **6**

B) Explain two wattmeter method for measurement of power in three phase circuit. **CO2** **6**

Q. 4 Solve Any Two of the following. **12**

A) The inductance of moving iron ammeter is given by following expression $L=(20+10\Theta-2\Theta^2)\ \mu H$, where, Θ is deflection in radians. The spring constant is $24X10^{-6}$ Nm/rad. Calculate the values of deflection for a current 5A. **CO1** **6**

B) With a neat, labeled diagram explain Maxwell's Inductance bridge and obtain the output equation for Lx and Rx **CO2** **6**

C) With a circuit & phasor diagram derive the equation for an unknown self-inductance measurement using HAY'S bridge. **CO3** **6**

Q. 5 Solve Any Two of the following. **12**

A) Explain the working of Q Meter. **CO1** **6**

B) Draw and explain Ramp type DVM in detail. **CO2** **6**

C) Explain in detail the construction and working of digital storage oscilloscope. **CO3** **6**

Q. 6	**Solve Any Two of the following.**		**12**
A)	Explain the working of strain gauge in detail.	**CO1**	**6**
B)	Explain different characteristics of transducer.	**CO2**	**6**
C)	With a neat, labeled diagram explain the operation of LVDT.	**CO3**	**6**

***** End *****