

 <p><b>ADAMAS UNIVERSITY</b> PURSUE EXCELLENCE</p>	<p align="center"><b>ADAMAS UNIVERSITY</b>  <b>END-SEMESTER EXAMINATION : JANUARY 2021</b>          (Academic Session: 2020 – 21)</p>		
<b>Name of the Program:</b> (Example: B. Sc./BBA/MA/B.Tech.)	B.Tech	<b>Semester:</b> (I/III/ V/ VII/IX)	III
<b>Paper Title :</b>	Electrical and Electronics Measurement	<b>Paper Code:</b>	EEE42103
<b>Maximum Marks :</b>	40	<b>Time duration:</b>	3 hours
<b>Total No of questions:</b>	8	<b>Total No of Pages:</b>	2
(Any other information for the student may be mentioned here)			

**Answer all the Groups**  
**Group A**

Answer all the questions of the following

$5 \times 1 = 5$

1.    a) What is the application of a null detector in an AC bridge?
- b) Why should a voltmeter be of very high resistance?
- c) Can the same moving iron instrument be used for both dc and ac measurements?
- d) What precautions are to be observed when using an ammeter?
- e) Which type of meter is most widely used in ac instruments for current and voltage measurements?

**GROUP –B**

Answer *any three* of the following

$3 \times 5 = 15$

2.    Derive the general equations for balance of an AC bridge.
3.    A PMMC instrument has a coil dimension of 15mm X 12mm. The flux density in the air gap is  $1.8 \times 10^{-3} \text{ Wb/m}^2$  and the spring constant is  $0.14 \times 10^{-6} \text{ Nm/rad}$ . Determine the number of turns required to produce an angular deflection of 90 degrees when a current of 5 mA is flowing through the coil.
4.    Discuss the advantages and disadvantages of moving iron instrument.
5.    A bridge consists of the following:

Arm ab – a choke coil having a resistance  $R_1$  and inductance  $L_1$

Arm bc – a non-inductive resistance  $R_3$

Arm cd – a mica condenser  $C_4$  in series with non-inductive resistance  $R_4$

Arm da- a non-inductive resistance  $R_2$

When this bridge is fed from a source of 500Hz, balance is obtained under following conditions:  $R_2 = 2410 \Omega$ ;  $R_3 = 750 \Omega$ ;  $C_4 = 0.35 \mu\text{F}$ ;  $R_4 = 64.5 \Omega$

The series resistance of capacitor is  $= 0.4 \Omega$ . Calculate the resistance and inductance of the choke coil. The supply is connected between a and c and the detector between b and d.

### GROUP –C

Answer *any two* of the following

$2 \times 10 = 20$

6. Describe the construction and working of PMMC instrument.
  7. Explain with proper circuit diagram, the operation of current transformer.
  8. Describe the operation of a low voltage Schering bridge. Derive the equations for capacitance and dissipation factor.
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