Code No: R1622021 **R16** SET - 1

II B. Tech II Semester Regular/Supplementary Examinations, April/May - 2019
ELECTRICAL MESUREMENTS
(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) Write about spring control of an instrument. (2M)
   b) Define phantom loading. (3M)
   c) What is potentiometer? Write its applications. (2M)
   d) Define Quality Factor and how it is to be measured. (2M)
   e) Define core loss and write methods to measure core loss. (3M)
   f) Explain the method for measurement of phase difference. (2M)

PART -B

2. a) Explain the principle of working of a PMMC instrument with neat diagram. (7M)
   b) Derive Expression for the deflecting torque and control torque for electrostatic instrument. (7M)

3. a) Explain how single phase power can be measured with instrument transformers. (7M)
   b) Explain measurement of single phase energy by induction type energy meter with suitable diagram. (7M)

4. a) Explain how the Resistance and current can be measured using a D.C Potentiometer. (7M)
   b) Explain coordinate type AC potentiometer and write its method of Standardization and Applications. (7M)

5. a) Explain kelvin's double bridge for measurement of low resistance with neat circuit and phasor diagram. (7M)
   b) Explain briefly the method of Measurement of earth resistance with circuit diagram. (7M)

6. a) Describe with a diagram a method of getting the relative permeability of the bar specimen using a flux meter. (7M)
   b) In a test on a specimen of total weight 13kg the measured values of iron loss at a given value of flux density were 17.2 watts at 40 Hz and 28.9watts at 60w. Estimate the values of hysterisis and eddy current losses at 50Hz for the same value of peak flux density. (7M)

7. a) Explain working principle of ramp type Digital Voltmeter with diagram. (7M)
   b) Explain how frequency can be measured using lissajious patterns in CRO. (7M)

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Code No: R1622021 **R16** SET - 2

II B. Tech II Semester Regular/Supplementary Examinations, April/May - 2019
ELECTRICAL MESUREMENTS
(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) Define deflecting torque and controlling torque. (2M)
   b) Write different errors occurred in single phase energy meter. (3M)
   c) What do you mean by standardization of potentio meter? (2M)
   d) How Hay's bridge is useful for the measurement of inductance. (2M)
   e) Write methods for the measurement of core loss. (3M)
   f) Explain working principle of Digital Tachometer. (2M)

PART -B

2. a) Why electro static instruments cannot be used for measurement of low voltages while electromagnetic instruments can be? Illustrate your answer with some specific example comparing the energy densities produced in electrostatic instruments and electromagnetic instruments. (7M)
   b) It is desired to extend the range of a DC milliammeter of the range 0 to 100 mA, to measure up to 1 A. The meter resistance R is 1 kΩ. Determine the value of shunt to be used and its multiplying power. (7M)

3. a) Explain construction and working principle of power factor meter with diagram. (7M)
   b) Briefly discuss Weston type synchro-scope for the measurement of frequency with diagram. (7M)

4. a) Draw the circuit diagram of a Crompton's D.C. potentiometer and Explain its working. (7M)
   b) Explain polar type AC potentiometer and write its method of Standardization and its Applications. (7M)

5. a) Explain megger for the measurement of high resistance with diagram and explain its advantages. (7M)
   b) Explain maxwell's inductance bridge for the measurement of inductance. (7M)

6. a) Explain the Determination of B–H Loop methods of reversals six point method. (7M)
   b) Explain Constructional details and working of Flux meter with diagram. (7M)

7. a) Draw block diagram and explain the working of CRO. (7M)
   b) Explain ramp type and integrating type digital multi meter with diagram. (7M)

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Code No: R1622021 **R16** SET - 3

II B. Tech II Semester Regular/Supplementary Examinations, April/May - 2019
ELECTRICAL MESUREMENTS
(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1.	a)	Define spring control and gravity control.	(2M)
	b)	Explain how active power is measured in balanced three phase system.	(3M)
	c)	Write applications of AC potentio meter.	(2M)
	d)	What are the different methods for measurement of medium resistance?	(2M)
	e)	Explain how core loss is measured with help of potentiometers.	(3M)
	f)	List the advantages of digital multimeters.	(2M)

PART -B

2.	a)	Explain different types of damping torques in measuring instruments.	(7M)
	b)	What value of shunt resistance is required for using 50μA meter movement with an internal resistance of 250Ω for measuring 0-500mA.	(7M)
3.	a)	Explain testing of single phase energy meter by phantom loading using R.S.S. meter.	(7M)
	b)	Explain working principle and operation of Electrical resonance type frequency meter with neat diagram.	(7M)
4.	a)	With a circuit diagram describe principle of operation of DC Crompton's Potentiometer.	(7M)
	b)	Describe the construction and working principle of AC polar type potentiometer and how it is standardized.	(7M)
5.	a)	Draw circuit diagram of Kelvin's double bridge for measuring low resistance and explain its balancing equations.	(7M)
	b)	Explain how capacitance is measured with Desauty Bridge and Schering Bridge.	(7M)
6.	a)	Explain Constructional details and working of Flux meter with diagram.	(7M)
	b)	Explain working of ballistic galvanometer with circuit diagram.	(7M)
7.	a)	Explain ramp type and integrating type digital multi meter with diagram.	(7M)
	b)	Explain ramp type digital frequency meter with diagram.	(7M)

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Code No: R1622021 **R16** SET - 4

II B. Tech II Semester Regular/Supplementary Examinations, April/May - 2019
ELECTRICAL MESUREMENTS
(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) Define ratio and phase angle error of CT. (2M)
   b) Distinguish LPF and UPF watt meters. (3M)
   c) What is potentiometer and how it is standardized. (2M)
   d) Explain the concept of the loss of charge method used in measuring insulation resistance. (3M)
   e) Define how core loss is measured with bridges. (2M)
   f) List the advantages of digital multimeters. (2M)

PART -B

2. a) Give the classification of electrical measuring instruments. (7M)
   b) Explain how do you extend the range of ammeter and voltmeter using shunts and series resistance. (7M)

3. a) Explain with a neat circuit of single phase Dynamometer type Wattmeter and derive the equation for deflection torque. (7M)
   b) Explain with neat diagram Single phase induction type energy meter and discuss its errors. (7M)

4. a) Describe the construction and working principle of AC polar type potentiometer and how it is standardized. (7M)
   b) A Potentiometer consisting of a resistance dial having 15 steps of 10 ohm each and a series connected slide wire of 10 ohm which is divided into 100 divisions. If the working of current of the potentiometer is 15 mA and each division of the slide wire can read accurately up to 1/5 of its span. Calculate the resolution of the potentiometer in volts. (7M)

5. a) Explain measurement of unknown resistance and Derive the balance conditions with Wheatstone's bridge and State its limitations. (7M)
   b) Explain the measurement of inductance by Maxwell's inductance bridge with necessary phasor diagram. (7M)

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6. a) Explain the operation of Ballistic Galvanometer with a neat diagram. (7M)

   b) A highly sensitive galvanometer can detect a current as low as 0.1 nA. This galvanometer is used in a Wheatstone bridge as a detector. The resistance of galvanometer is negligible. Each arm of the bridge has a resistance of 1K ohm. The input voltage applied to the bridge is 20V. Calculate the smallest change in the resistance, which can be detected. (7M)

7. a) Explain how voltage and current can be measured using CRO. (7M)

   b) Explain the working of Digital frequency meter and Digital multimeter. (7M)

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