Code No: RT31021 **R13** SET - 1

III B. Tech I Semester Regular Examinations, November - 2015
ELECTRICAL MEASUREMENTS
(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

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

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PART –A

1	a)	Explain the essential features of Indicating Instruments.	[4M]
	b)	What do you understand by Phantom or Fictitious loading in energy meters and why is it necessary?	[4M]
	c)	List out the limitations of AC potentiometers.	[3M]
	d)	How are detectors classified? Explain each one of them briefly.	[4M]
	e)	Explain briefly about Permeameters.	[3M]
	f)	Define resolution and Sensitivity of Digital voltmeter.	[4M]

PART -B

2	a)	Derive the torque equation of a moving iron instrument and further comment up on the nature of scale.	[8M]
	b)	The primary winding of a 1200/6A, 50 Hz current transformer has a single turn. Its secondary burden consists of a non – inductor impedance of 1.6 Ω. If the iron loss in the core is 1.6 W at full load and magnetizing mmf is 80 AT, calculate the i) flux in the core, ii) Ratio error at full load. Neglect leakage reactance.	[8M]
3	a)	Explain the working of Dynamometer type single phase power factor meter with a neat diagram.	[8M]
	b)	Explain the different sources of errors in Induction type Energy meter and how they can be adjusted/compensated.	[8M]
4	a)	Explain the working of a polar type potentiometer with a neat diagram.	[8M]
	b)	Explain how the Resistance and current can be measured using a D.C Potentiometer.	[8M]
5	a)	Explain any one method for the measurement of high resistance and explain its advantages over other methods.	[10M]
	b)	List the null/balance detectors that are commonly used for A.C. bridges and explain them briefly.	[6M]
6		Explain with a schematic diagram for the determination of Hysteresis loop by method of reversals.	[16M]
7	a)	Explain the working of Linear Ramp type Digital voltmeter with a neat schematic.	[8M]
	b)	Explain about Lissajious patterns in Cathode Ray Oscilloscope.	[8M]

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Code No: RT31021 **R13** SET - 2

III B. Tech I Semester Regular Examinations, November - 2015
ELECTRICAL MEASUREMENTS
(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

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

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PART –A

1	a)	Explain about Spring control and gravity control controlling devices.	[4M]
	b)	What do you mean by Creeping error in Induction Energy meter and how it can be adjusted?	[4M]
	c)	Explain the procedure for standardizing the potentiometer.	[4M]
	d)	State the applications of Wein bridge.	[3M]
	e)	Define the following terms related to magnetic materials: i)Magnetic field strength ii) Curie temperature.	[4M]
	f)	Compare between Analog and Digital Instruments.	[3M]

PART -B

2	a)	Explain the working of Moving iron Attraction type of Instrument with a neat diagram.	[8M]
	b)	Derive the expressions for the ratio and phase angle errors of a current transformer with a neat phasor diagram.	[8M]
3	a)	Explain the working of Induction type single phase Energy meter with a neat diagram.	[8M]
	b)	A 50 A, 230V meter on full load test makes 61 revolutions in 37 seconds. If the normal disc speed is 520 revolutions per KWH, find the percentage error.	[8M]
4	a)	How does an AC potentiometer different from a DC Potentiometer.	[6M]
	b)	Explain how the calibration of Voltmeter and Wattmeter can be done using a DC Potentiometer.	[10M]
5	a)	Explain the procedure for measurement of medium resistance using Carey – Foster slide – wire bridge method and derive the necessary equation.	[10M]
	b)	Deduce the general equation or condition for bridge balance in AC Circuits.	[6M]
6	a)	Explain the operation of Ballistic Galvanometer with a neat diagram.	[8M]
	b)	Explain the AC bridge method for measurement of iron losses in ferromagnetic materials.	[8M]
7	a)	Explain the working of Successive Approximation type Digital Voltmeter with a neat diagram.	[8M]
	b)	Explain the working of Digital Tachometer with a neat block diagram.	[8M]

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Code No: RT31021 **R13** SET - 3

III B. Tech I Semester Regular Examinations, November - 2015
ELECTRICAL MEASUREMENTS
(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

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

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PART –A

1	a)	Explain the significance of Eddy current damping in an indicating Instrument.	[3M]
	b)	Distinguish between the balanced and unbalanced loads.	[4M]
	c)	Explain the significance of a Potentiometer.	[3M]
	d)	Discuss the common sources of error in AC bridges. How are they eliminated?	[4M]
	e)	How are magnetic materials classified?	[4M]
	f)	List out the advantages of Digital Voltmeters.	[4M]

PART -B

2	a)	Derive the equation for deflection of a Dynamometer type of instruments which can be used for both DC and AC.	[8M]
	b)	What are the advantages of Instrument transformers over Ammeter shunts and Voltmeter multipliers?	[8M]
3	a)	Explain with a neat circuit of Dynamometer type Wattmeter and derive the equation for deflection.	[10M]
	b)	List the various types of errors in dynamometer type Wattmeter's.	[6M]
4	a)	Explain the working of Crompton Potentiometer with a neat diagram.	[8M]
	b)	Explain the standardization procedure for the AC Potentiometer. Explain how AC Potentiometer can be used for the measurement of self inductance of a coil.	[8M]
5	a)	Explain with a neat diagram for the measurement of Inductance using Hay bridge and also derive the relation for inductance under balanced condition using a neat phasor diagram.	[10M]
	b)	Explain the Dissipation factor of a lossy dielectric. How can it be measured?	[6M]
6		Explain the construction and working of Grassot flux meter with a neat diagram and also prove that "the change in the value of flux is directly proportional to the change in deflection" in this case.	[16M]
7	a)	Explain the working of Dual slope Integrating type Digital Voltmeter with a neat schematic diagram.	[8M]
	b)	Explain the working of Digital frequency meter with a neat block diagram.	[8M]

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Code No: RT31021 **R13** SET - 4

III B. Tech I Semester Regular Examinations, November - 2015
ELECTRICAL MEASUREMENTS
(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

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

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PART –A

1	a)	Define the following terms related to Instrument transformers i)Transformation ratio ii)Turns Ratio	[4M]
	b)	Define LPF and UPF wattmeter's and give their significance.	[4M]
	c)	What are the applications of self balancing Potentiometers?	[3M]
	d)	From the point of measurement, how can resistances be classified.	[4M]
	e)	List the precautions needed to be taken in Magnetic testing.	[4M]
	f)	Explain the basic block diagram of a Digital voltmeter.	[3M]

PART -B

2	a)	Explain with a neat diagram the Quadrant type of Electrostatic Instrument.	[8M]
	b)	A moving coil milli ammeter having a resistance of 10Ω gives full scale deflection when a current of 5 mA is passed through it. Explain how this instrument can be used for measurement of i) Current up to 1A, ii) Voltage up to 5 V.	[8M]
3	a)	Explain how a power measurement range can be extended with a wattmeter in conjunction with an instrument transformer.	[8M]
	b)	A single phase KWh meter makes 500 revolutions per KWh. It is found, on testing, as making 40 revolutions in 58 seconds at 5 KW full load. Find out the percentage error.	[8M]
4	a)	Explain the working of Gall Co-ordinate type Potentiometer with a neat diagram.	[10M]
	b)	Explain how the Voltage and power can be measured using a dc Potentiometer.	[6M]
5	a)	Explain the procedure of measuring a low resistance with the help of Kelvin's double bridge. Derive the necessary relation for finding the unknown resistance under balanced condition of the bridge.	[10M]
	b)	Explain the importance of Wagner's earthing device.	[6M]
6	a)	Explain the AC Potentiometer method for measurement of iron losses in ferromagnetic materials.	[8M]
	b)	Give the merits and demerits of ring and bar specimens that are commonly used in magnetic testing of materials.	[8M]
7	a)	List the general specifications of Digital Voltmeters.	[8M]
	b)	Explain the basic scheme of Digital multimeter along with its advantages.	[8M]

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