Code No: **R31022** **R10** **Set No. 1**

III B.Tech I Semester Supplementary Examinations, May-2017
ELECTRICAL MEASUREMENTS
(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1	a)	Explain with a neat sketch the construction and operation of a moving iron instrument.	[7M]
	b)	Discuss various errors that occur in measurements and how can they be compensated.	[8M]
2	a)	Explain the disadvantages of shunts and multipliers when used for extension of range. Explain how instrument transformers are a better substitute for shunts and multipliers especially for high range values.	[7M]
	b)	Explain the function of a current transformer. How does a current transformer differ from an ordinary power transformer?	[8M]
3	a)	Explain how the range of wattmeter can be extended? Differentiate between LPF and UPF meter.	[7M]
	b)	Draw a neat sketch and explain the operation of a single phase induction type energy meter.	[8M]
4	a)	A simple slide wire is used for measurement of current in a circuit. The voltage drop across a standard resistor of 0.1 ohm is balanced at 75 cm. Find the magnitude of current if the standard cell emf of 1.45V is balanced at 50 cm	[7M]
	b)	Discuss how D.C. Crompton's potentiometer is used to measure an unknown resistance, current and voltage?	[8M]
5	a)	What are the different difficulties encountered in the measurement of high resistances? Explain how these difficulties are overcome.	[8M]
	b)	A highly sensitive galvanometer can detect a current as low 0.1 nano-Amperes. This galvanometer is used in a wheat-stone bridge as a detector. The resistance of galvanometer is negligible. Each arm of the bridge has a resistance of 1KΩ.The input voltage applied to the bridge is 20V. Calculate the smallest change in resistance, which can be detected. The resistance of the galvanometer can be neglected as compared with the internal resistance of bridge.	[7M]
6		A balanced 1 KHz bridge has the following configuration: Arm AB: R1 = 1000Ω in parallel with C1 = 0.053μF Arm BC: R2 = 1500Ω in series with C2 = 0.53μF Arm CD: the unknown Arm DA: Pure capacitance C4= 0.265 μF. Determine R and L or C constants of the unknown. Draw the phasor diagram of the bridge at above frequency.	[15M]
7	a)	Explain the procedure for obtaining iron loss of bar samples	[7M]
	b)	Explain with the help of a neat diagram, a method for the determination of B-H curve of a magnetic sample.	[8M]
8	a)	Explain the operation of a digital multi meter.	[7M]
	b)	Explain about each block of digital voltmeter and mention its advantages.	[8M]

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