B.E. Instrumentation Engineering (CBCS Pattern) Third Semester CBCS 3BEIE05 – Electronics Measurement

P. P Tim	ages : 2 ie : Thr	2 ee Hours $* 3 5 9 5 *$	GUG/W/18/11515 Max. Marks : 80		
	Note	 s: 1. All questions carry marks as indicated. 2. Assume suitable data wherever necessary. 3. Illustrate your answers wherever necessary with 4. Same answer book must be used for all questions. 	th the help of neat sketches. on.		
1.	a)	Define the following term along with a suitable example :			
		i) Units ii) Absolut	e units		
		iii) Fundamental units iv) Derived	lunits		
	b)	A voltmeter reads 70 volts on its 100 V range and an MA range are used to determine the power dissipated ir generated to be accurated with ± 1.5 at a full scale defined of the power.	ammeter reading 80 MA on its 150 8 resistor. Both these instruments are ection. Determine the limiting error		
		OR			
2.	a)	State the static and dynamic performance characteristic	s of measurement system. 8		
	b)	Describe in details the different types of errors in measurement.			
3.	a)	Draw and explain the construction, and working princi	ple of PMMC type Instruments. 8		
	b)	Describe the construction and working of a shunt type ohm meter. Write down it's design equations. Why series type ohm meters preferred over shunt type ohm meter.			
		OR			
4.	a)	Discuss the constructional details and working of an ele	ectrodynamometer type instruments. 8		
	b)	The coil of a moving coil voltmeter is 40 mm long and it. The control spring exerts a torque of 240×10^{-6}	1 30 mm wide and has 100 turns on 8 Nm. When the deflection is 100		
		divisions on full scale. It the flux density of the magnet Calculate the resistance that must be put in series wit resistance of the voltmeter coil may neglected.	ic field in the air gap is $1.0 \text{ wb}/\text{m}^2$. h the coil to give 1V/division . The		
5.	a)	Describe methods for measurement of resistance using limitations of wheat stone bridge.	wheat stone bridge and also write 8		
	b)	A Kelvin bridge is balanced with the following constant Outer ration arm = 100Ω and 1000Ω Inner ration arm = 99.92Ω and 1000.6Ω	nts : 8		
		Resistance of link = 0.1Ω			
		Standard resistance = 0.00377Ω			
		Calculate the value of unknown resistance.			

6.	a)	Discuss the sources and detectors in AC bridges.				
	b)	Describe the working of Hay's bridge for measurement of inductance. Derive the expression for balance and draw phasor diagram under balanced condition. Why this bridge is suited for measurement of inductance of high Q coils?				
7.	a)	Write a short note on :	8			
		i) Electronic voltmeter.				
		ii) Amplified DC Meter.				
	b)	Explain with the help of block diagram the various part of an Electronic multi meter.	8			
		OR				
8.	a)	 a) Discuss True R.M.S. reading voltmeter. State it's advantages and limitations and also explain how these voltmeters are free from waveform error. b) Describe the circuit and working of Q meter, give it's applications. 				
	b)					
9.	a)	Discuss in details of Digital Storage Oscilloscope. Also write its applications.	8			
	b)	What is delay sweep of CRO. Explain in brief.	8			
	OR					
10.	a)	Draw the block diagram of dual trace oscilloscope. Explain each block into details.	8			

OR

- b) An electrically deflected CRT has a final anode voltage of 2000 V and parallel deflecting **8** plates 1.5 cm long and 5mm apart. If the screen Rs. 50cm from the centre of deflecting plates, Find if mass of electron 9.1×10^{-31} kg.
 - i) Beam Speed, if charge of electron is 1.6×10^{-19} C.
 - ii) The deflection sensitivity of the tube.
 - iii) The deflection factor of the tube.
