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Reg. No. : | | | | | | | | | | |

Question Paper Code: 52409

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Second Semester

Electronics and Communication Engineering

15UEC209 - BASIC ELECTRONIC MEASUREMENTS

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Failure to set the instrument to zero before making a measurement is CO1- R

   (a) random error (b) gross error (c)environmental error (d) instrumental error

2. If the full scale deflection current of a voltmeter is 0.001A then sensitivity of the voltmeter is CO2-App

   (a) 1000 Ω/V (b) 100 Ω/V (c) 10 Ω/V (d)1 Ω/V

3. The bridge used to measure medium Q coils (1< Q < 10) CO3- R

   (a) Hay bridge (b) Maxwell bridge (c) Schering bridge (d) Kelvin bridge

4. The process of emitting light when stimulated by radiation is CO4- R

   (a) luminance (b) phosphorescence

   (c) fluorescence (d) persistence

5. The analyzer that acts similar to an up-converting super heterodyne receiver CO5- R

   (a) Spectrum analyzer (b) Harmonic analyzer

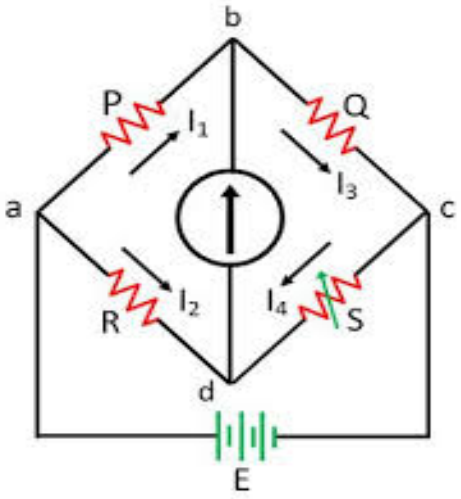
   (c) Wave analyzer (d) Frequency analyzer

PART – B (5 x 3= 15Marks)

6. A set of independent current measurements was taken by six observers and recorded as 12.8 mA, 12.2 mA, 12.5 mA, 13.1 mA, 12.9 mA and 12.4 mA. Calculate (a) Arithmetic mean and (b) the deviation from mean. CO1- App

7. A 1 mA meter movement with an internal resistance of 100 Ω is to be converted into a 0-100mA ammeter. Calculate the value of the shunt resistance required. CO2-App

8. Write the condition for balancing the bridge and find the value of S given P =100 Ω, Q = 1000 Ω and R =200 Ω. CO3-App



9. List the disadvantages of analog storage oscilloscope. CO4- R

10. What will be the ratio of the highest to the lowest frequency of an oscillator if a (50 – 350) pF variable capacitor is used in the tuned circuit? CO5 -R

PART – C (5 x 16= 80Marks)

11. (a) The following values were obtained from the measurements of the value of a resistor: 147.2 Ω, 147.4 Ω, 147.9 Ω, 148.1 Ω, 147.1 Ω, 147.5 Ω, 147.6 Ω, 147.4 Ω, 147.6 Ω and 147.5 Ω. Calculate CO1- App (16)
(a) Arithmetic mean
(b) Deviation from mean
(c) Average deviation
(d) Standard deviation
(e) Probable error and
(f) Variance

Or

	(b)	Describe the different types of standards and discuss on the electrical standards to measure resistance, capacitance and inductance.	CO1- U	(16)
12.	(a)	Discuss on the design of d' Arsonval movement and describe how temperature compensation is provided in d'Arsonvalmovement.	CO2- U	(16)
		Or		
	(b)	Analyze a series type ohmmeter and using the results obtained, find (a) the values of R_1 and R_2 (b) the maximum value of R_2 to compensate for a 10% drop in battery voltage. The ohmmeter uses a 50Ω basic movement requiring a full scale current of 1mA. The internal battery voltage is 3V. The desired scale marking for half scale deflection is 2000Ω.	CO2- Ana	(16)
13.	(a)	What is the effect of leakage currents on bridge circuits? Explain any two methods to eliminate leakage effects in bridge circuits.	CO3- U	(16)
		Or		
	(b)	Derive the balance equations for the following : (i) Maxwell Bridge (8 Marks) (ii) Hay bridge (8 Marks)	CO3- App	(16)
14.	(a)	Describe digital storage oscilloscope with suitable diagrams.	CO4- U	(16)
		Or		
	(b)	(i) Explain the block diagram of a general oscilloscope.	CO4- U	(10)
		(ii) Comment on the screens used in Cathode ray tubes.	CO4- U	(6)
15.	(a)	Explain frequency synthesized signal generator with required diagrams.	CO5- U	(16)
		Or		
	(b)	(i) Elaborate the operation of audio frequency function generator.	CO5- U	(8)
		(ii) Evaluate the pertinent characteristics of a pulse.	CO5- E	(8)