SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
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QUESTION BANK (DESCRIPTIVE)

Subject with Code : EMI(16EC416)   **Course & Branch**: B.Tech – ECE

Year & Sem: III B.Tech & I Sem   **Regulation:** R16

UNIT –I

1.a) Explain about static characteristics of measuring instrument.   [CO1][L2][5M]
   b) Define any two statistical analysis of measuring instrument.   [CO1][L1][5M]
2. a) Explain the construction of multi-range voltmeter& Range extension DC voltmeter. [CO1][L2][5M]
   b) A D'Arsonval movement with a full scale deflection current of 50 µA and internal resistance of
   500Ω is to be converted into a multirange voltmeter .define the value of multiplier required for
    0-20v, 0-50v,0-100v,   [CO1][L5][5M]
3. a) Explain different types of errors that occur in measurements.   [CO1][L2][5M]
   b) Explain about Differential type voltmeter.   [CO1][L2][5M]
4. a) How do we determine the performance characteristics(static & dynamic) of an instrument.
                                                                          [CO1][L1][8M]

   b) Explain the process of calibration.   [CO1][L1][2M]

5. a) Define sensitivity. Calculate the sensitivity of a 200 µA meter movement which is to be used as a dc
   voltmeter.   [CO1][L1][2M]
   b) Draw and explain solid state DC Voltmeter.   [CO1][L2][8M]
6. a) Explain the dynamic response of Zero order, first order, second order instrument.   [CO1][L2][7M]
   b) Explain multirange AC voltmeter.   [CO1][L2][3M]
7. a) With neat sketch explain thermocouple type RF ammeter.   [CO1][L2][7M]
   b) Discuss about basic DC Ammeters.   [CO1][L2][3M]
8. a) Describe with the help of circuit diagram the construction and working of a shunt-type ohm meter
                                                                          [CO1][L2][7M]

   b) Explain the fundamental principle on which DC meter is constructed.   [CO1][L2][3M]
9. a)Explain how a multi-meter can be used as   i) DC voltmeter &   AC volt meter   [CO1][L2][7M]
   b) Explain how a multi-meter can be used as Ohmmeter   [CO1][L2][3M]
10. a) Explain with the help of circuit diagram the construction & working of a series type ohm meter.
                                                                          [CO1][L2][7M]
   b) Explain about basic DC Ammeter.   [CO1][L2][3M]

UNIT –II

1. a)Draw the neat diagrams of vertical deflection systems and explain briefly about their working.
   [CO2][L2][7M]
   b) Discuss briefly about Horizontal amplifier   [CO2][L2][3M]
2. a) Discuss about important CRT features.   [CO2][L1][3M]
   b) Draw the block diagram of a dual beam oscilloscope & explain its working.   [CO2][L2][7M]
3. a)Draw the block diagram of a general purpose oscilloscope(CRO) and explain function of each block
   in detail .   [CO2][L2][8M]
   b) List the applications of CRO   [CO2][L1][2M]
4. a) Explain the major parts of CRT with a block diagram.   [CO2][L2][7M]
   b) Compare dual trace oscilloscopes and dual beam CRO.   [CO2][L4][3M]
5. a) Draw the block diagram of Delay line circuit and explain its working.   [CO2][L2][7M]
   b) State the standard specifications of a sample CRO.   [CO2][L4][3M]
6. a) Discuss in detail, the construction and working of a digital sampling oscilloscope. [CO2][L2][5M]
   b) Explain in details the construction and working of Time base generator   [CO2][L2][5M]
7. a) Describe in details the construction and working of an analog type storage oscilloscope.
                                                        [CO2][L2][5M]
   b) Explain with the block diagram how the digital frequency can be measured using counter/meter
      instrument.   [CO2][L2][5M]
8. a) Describe in details the construction and working of an digital storage oscilloscope [CO2][L2][5M]
   b) Explain the function of trigger circuit.   [CO2][L2][5M]
9. a) Explain with a diagram how frequency & phase can be measured using a Lissajous method.
                                                        [CO2][L1][5M]
   b) Briefly discuss about digital storage oscilloscope.   [CO2][L1][5M]
10. a) Explain with the block diagram how the digital frequency and time period can be measured using
       Counter/meter   instrument.   [CO2][L1][6M]
    b) List and explain any two different types of CRO probes?   [CO2][L1][4M]

UNIT –III

1. a) With the help of block diagram explain the functioning of a conventional standard signal generator.
[CO3][L2][7M]

   b) Describe about fixed AF oscillator and variable AF oscillator. [CO3][L2][3M]
2. a) Draw the block diagram of a function generator and explain its operation. [CO3][L2][7M]

   b) List the applications of random noise generator. [CO3][L2][3M]
3. a) With a neat diagram discuss the operation of a pulse generator. [CO3][L2][6M]

   b) Explain the working of arbitrary waveform generator [CO3][L2][4M]
4. a). Discuss in detail about RF signal generator operation. [CO3][L2][5M]

   b) Explain the method of generating of random noise with neat sketch [CO3][L2][5M]
5. a) Explain the working of a standard sweep generator with diagram. [CO3][L2][7M]

   b) Define sweep generator [CO3][L1][3M]
6. a) With help of a neat sketch, explain the working of a frequency selective wave analyser.
[CO3][L2][7M]

   b) Define the function of wave analyser? [CO3][L1][3M]
7. a) Describe with diagram the operation of a Logic analyser. [CO3][L2][7M]

   b) List the application of wave analysers. [CO3][L1][3M]
8. a) Draw the circuit diagram and explain the working of a heterodyne type wave analyser.
[CO3][L2][7M]

   b) What is distortion? What does a distortion analyser measure [CO3][L1][3M]
9. a) Define the function of harmonic distortion analyser. [CO3][L1][3M]

   b) Describe the diagram with operation of a harmonic distortion analyser using Wein bridge and
      frequency selective type. [CO3][L2][7M]
10. a) With a neat sketch explain the operation of Spectrum analyser. [CO3][L2][5M]

    b) Explain how wave analyser can be tuned to a particular frequency within the audible frequency
       range. [CO3][L2][5M]

UNIT –IV

1. a) Discuss the working principle of Q-meter &its applications.   [CO4][L2][6M]

   b) Write short note on interference & explain noise reduction techniques.   [CO4][L2][4M]

2. a)Explain any Two ac bridges to measure unknown inductance.   [CO4][L2][8M]

   b)Distinguish between AC Bridges and DC bridges   [CO4][L2][2M]

3. a) Describe in detail about EMI &EMC with suitable examples.   [CO4][L2][4M]

   b) Explain the working principle & operation of Capacitance & Inductance bridge circuit [CO4][L2][6M]

4. a) Explain the operation of Kelvin Bridge.   [CO4][L2][4M]

   b) Derive the expression for unknown resistance of kelvin bridge   [CO4][L2][6M]

5. a)Discuss briefly about bridges?   [CO4][L2][3M]

   b) Draw the Anderson's bridge circuit and derive necessary equations& explain it. [CO4][L2][7M]

6. a) Explain the Schering bridge circuit   [CO4][L2][8M]

   b) List the applications of schering bridge circuit   [CO4][L1][2M]

7. a) Explain how a Maxwell bridge can be used for measuring an unknown inductance.   [CO4][L2][6M]

   b) What is interference &explain noise reduction techniques.   [CO4][L2][4M]

8. a)Describe the operation of the Wheatstone bridge   [CO4][L2][5M]

    b) Derive the expression for current when the bridge is balanced.

                                                                        [CO4][L2][10M]

9. a) Explain how a Maxwell bridge can be used for measuring an unknown inductance.   [CO4][L2][5M]

   b) A Maxwell bridge is used to measure an inductive impedance the bridge constants at balance are
   C1=0.01 μF, R1=470KΩ, R2=5.1 KΩ and R3=100 KΩ. Find the series equivalent of the unknown
   impedance.   [CO4][L5][5M]

10.a) What are the applications of Wheatstone bridge. And list out its limitations.   [CO4][L2][4M]

   b) Describe the operation of the Wheatstone bridge and derive the expression for DC resistance.

                                                                        [CO4][L2][6M]

UNIT –V

1. a) With a neat sketch explain the operation of LVDT.   [CO5][L2][8M]
   b) What are the advantages & disadvantages of LVDT   [CO5][L2][2M]

2. a)Explain strain gauge for resistance measurement   [CO5][L2][8M]
   b) List the applications of LVDT   [CO5][L2][2M]
3. a)Describe the operation of i) resistive transducers   [CO5][L2][5M]
   b) Describe the operation of capacitive transducers.   [CO5][L2][5M]
4. a) Distinguish between the active & passive transducers.   [CO5][L2][3M]
   b) Explain the operation of potentiometric transducer.   [CO5][L2][7M]
5. a) Define a transducer. List the applications.   [CO5][L1][3M]
   b) Explain about Inductive transducers.   [CO5][L2][7M]
6. a) Draw the diagram of Resistance Thermometer & explain briefly.   [CO5][L2][7M]
   b) What are the functions of transducers?   [CO5][L1][3M]
7. a) Write short notes on i) LVDT ii) thermocouple   [CO5][L2][6M]
   b) Discuss about signal conditioning circuits.   [CO5][L2][4M]
8. a) With a neat sketch, explain the operation of piezo-electric transducers in detail.   [CO5][L2][7M]
   b) Explain how an electrical transducer can be used to find the unknown pressure of a liquid.
                                                                        [CO5][L2][3M]
9. a) List the three types of temperature transducers &describe the application of each. [CO5][L2][5M]
   b) Explain about pH measurement.   [CO5][L2][5M]
10.a) Define piezoelectric effect. Write the applications of piezoelectric transducer.   [CO5][L2][5M]
   b) Write about IC sensors & smart sensors.   [CO5][L2][5M]

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