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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ETE) / (ECE) / (Electronics & Computer Engg.) (2011 Onwards)/
B Tech.(Electronics Engg.) (2012 Onwards)
(Sem.-4)

ELECTRONIC MEASUREMENT & INSTRUMENTATION

Subject Code : BTEC-404

M.Code : 57596

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION-A

1. **Answer briefly :****(2×10=20)**

- a. Compare Hay's Bridge and Maxwell's Bridge.
- b. Write the working principle of a non planar display device.
- c. Describe the terms: resolution and hysteresis.
- d. What will be the output on screen of CRO if a sinusoidal voltage is applied to vertical deflection plates but no voltage is applied to horizontal deflection plate?
- e. Explain the terms: Dissipation Factor and Q factor.
- f. What is the principle of photoelectric transducers? Give examples.
- g. What controls the frequency of the displayed signal on CRO?
- h. What are the various dynamic characteristics of instrumentation system?
- i. What do you understand by LVDT?
- j. Find the series equivalent inductance and resistance of the network that causes such a bridge to null with following bridge arms: $\omega = 3\text{KHz}$, R and C in series of $2\text{K}\Omega$ and $1\mu\text{F}$ in one arm, two other opposite arms have $10\text{K}\Omega$ in one and $1\text{K}\Omega$ in other arm.

SECTION-B

2. With the help of Block diagram and suitable waveforms explain Integrating type digital voltmeters. 5
3. Explain the working and applications of Piezoelectric crystal. 5
4. Explain the principle and various components used for magnetic recorders? 5
5. How can the frequency be measured? Give its circuit and derive the relations. 5
6. What is telemetry? Explain **any two** applications of telemetry. 5

SECTION-C

7. a) Give construction and working of PMMC instruments with torque equation. 7
b) A PMMC has a coil dimension of $17\text{mm} \times 13\text{mm}$. the flux density in the air gap is $1.9 \times 10^{-3} \text{ Wb/m}^2$ and spring constant is $0.17 \times 10^{-6} \text{ Nm/rad}$. Determine the number of turns required to produce an angular deflection of 90° when a current of 7mA flowsthrough the coil. 3
8. a) Explain the working of Schering bridge and derive an expression for measurement of unknown capacitance and its loss angle. Draw the phasor diagram under null conditions. 6
b) Determine the value of R_1 and L_1 of the inductor connected in Maxwell capacitance bridge circuit. One arm has C_4 and R_4 in parallel of $0.5\mu\text{F}$ and $1 \text{ K}\Omega$. Other two opposite arms have resistance of $R_2 = 400\Omega$ and $R_3 = 600\Omega$. Also find the Q factor of the coil if $f = 1 \text{ KHz}$. 4
9. a) Explain the block diagram of CRO in detail. Give the application of CRO for measurement of phase and frequency. 7
b) Describe Harmonic distortion analyzer. 3

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.