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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 briefy : (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: $\omega = 3KHz$, R and C in series of $2K\Omega$ and $1\mu F$ in one arm, two other opposite arms have $10K\Omega$ in one and $1K\Omega$ 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 17mm × 13mm. the flux density in the sir gap is 1.9×10^{-3} Wb/m^2 and spring constant is 0.17×10^{-6} 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 0.5μF and 1 KΩ. 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 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.