

(b) (i) Derive the expression for vertical deflection of an electron beam in a CRT and sensitivity of CRT.

(ii) Draw the Lessajous patterns for same voltage put frequency  $f_x = \frac{7}{2} f_y$  inputs are connected to  $y$  and  $x$  plates of the oscilloscope respectively.

(c) (i) An oscillation has an input capacitance 50 PF and resistance of  $2 M\Omega$  and the voltage divider ratio of 10. What are the parameters of a high impedance probe?

(ii) Write a short note on storage oscilloscope.

5 Attempt any **four** parts of the following :  $5 \times 4 = 20$

- Discuss the function of wave analyzer.
- Discuss the different types of analog instruments based on measurements.
- Explain in brief spectrum analyzer.
- Explain the working of function generator.
- Write a short note on the working of Harmonic distortion meter.
- Define the terms :
  - Accuracy
  - Resolution
  - Linearity
  - Static sensitivity.



Printed Pages : 4

TEC-303

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 3075

Roll No. 

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**B. Tech.**

(SEM. III) EXAMINATION, 2007-08

**ELECTRONICS MEASUREMENTS & INSTRUMENTATION**

Time : 3 Hours]

[Total Marks : 100

- Note :*
- Attempt **all** questions.
  - All questions carry **equal** marks.
  - Be **precise** in your answer.
  - No **second** answer book will be provided.

1 Attempt any **four** parts of the following :  $5 \times 4 = 20$

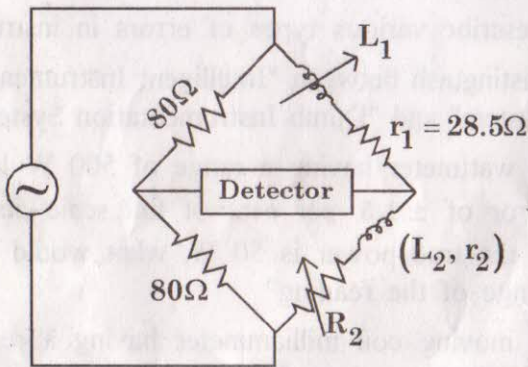
- Describe various types of errors in instruments.
- Distinguish between "Intelligent Instrumentation System" and "Dumb Instrumentation System".
- A wattmeter having a range of 500 W has an error of  $\pm 1.5$  per cent of full scale deflection. If the true power is 50 W, what would be the range of the reading?
- A moving coil milliammeter having a resistance of 10 ohms gives full scale deflection when a current of 5 mA is passed through it.

Explain how this instrument can be used for measurement of

- (i) Current upto 1 A
  - (ii) Voltage upto 5 V.
- (e) Differentiate between the primary and secondary transducer.
- (f) Describe the method for measurement of temperature with use of RTD and Thermistor.

2 Attempt any **four** of the following : 5×4=20

- (a) Describe the working of a low voltage Schering bridge.
- (b) Explain briefly electronic multimeter.
- (c) Explain vector impedance-meter with the help of block diagram.
- (d) In a bridge shown in **figure** below the balance was obtained with  $L_1 = 52.6$  mH and  $R_2 = 1.68 \Omega$ . Find the resistance and inductance of coil.



- (e) A circuit having an effective capacitance of 160 PF is tuned to a frequency of 1.2 MHz. In this circuit the current falls to 70.2% of its resonant value when the frequency of an e.m.f. of constant magnitude injected in series with the circuit deviates from the resonant frequency by 6 kHz. Calculate the Q factor and effective resistance of the circuit.
- (f) Discuss the circuit for measurement of power at radio frequencies.

3 Attempt any **two** parts of the following : 10×2=20

- (a) Describe the working of an integrating type digital voltmeter. A D/A converter has 6 bits and a reference voltage of 10 V. Calculate the minimum value of R such that the maximum value of output current does not exceed 10 mA. Find also the smallest quantized value of output current.
- (b) Explain the theory and working of LCDs. Describe the advantage of LEDs.
- (c) Draw the circuit of a digital frequency meter. Explain the difference between  $3\frac{1}{2}$  digits and 4 digits displays.

4 Attempt any **two** parts of the following : 10×2=20

- (a) Describe the following for CRO circuit :
  - (i) Blanking circuit
  - (ii) Z axis modulation
  - (iii) Astigmatism control
  - (iv) Time base generator.