

This question paper contains 3 printed pages]

Roll No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

S. No. of Question Paper : 8764

Unique Paper Code : 251505

C

Name of the Paper : ELHT-503 Electronics Instrumentation

Name of the Course : B.Sc. (H) Electronics

Semester : V

Duration : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt Five questions in all. Question No. 1 is compulsory.

All questions carry equal marks.

1. Attempt any five of the following :

5×3=15

- (a) Determine the sensitivity of a DC voltmeter whose full scale deflection (I_{fsd}) is 1mA.
- (b) How does alternate sweep compare with chopped sweep? Under what conditions is one method preferred over the other?
- (c) Define the following terms :
 - (i) rise time
 - (ii) duty cycle
 - (iii) overshoot.
- (d) Give three advantages and three disadvantages of a thermocouple.
- (e) Give the operating frequency range of a RF generator, an audio generator and a function generator.
- (f) Distinguish between accuracy and precision of a measurement.

P.T.O.

2. (a) What is the loading effect of a voltmeter ? 2
- (b) Convert a basic D'Arsonval movement with an internal resistance of 50Ω . and full scale deflection current of 2mA into a multirange dc voltmeter with voltage ranges of 0–10V, 0–50V, 0–100V. 6
- (c) Give the block diagram of Ramp type DVM and explain its operating principle. 7
3. (a) Give the block diagram of a frequency counter and explain the frequency measurement mode. 6
- (b) Explain what is "Gating Error". 2
- (c) How would you measure the Q of low impedance components such as low value resistors, small coils and large capacitors? 7
4. (a) Show that CRO is a linear voltage indicating instrument. Obtain an expression for the deflection sensitivity of a Cathode Ray Tube. 7
- (b) The vertical sensitivity of a scope is set to 20mV/div, how much and in what direction will the following voltages applied to the vertical inputs of the scope deflect the spot :
- (i) 0.3 V
- (ii) -100 mV 4
- (c) What is the difference between real time sampling and equivalent time sampling ? Which of them is used if the frequency of the waveform to be viewed is very high ? 4

5. (a) Explain with the help of a diagram the working of a function generator and how it generates triangular, square and sine wave output waveforms. 6
- (b) Draw the diagram of a sine to square wave conversion circuit using diode clipping. Explain how the circuit operates. 5
- (c) Under what conditions is it allowable to use test leads and how do they pick up interference? What kind of test lead can be used to minimize this problem? 4
6. (a) Explain with the help of a diagram the operation of a frequency selective analyzer. What are its main applications? 8
- (b) Explain the working of a single phase wattmeter. How is it used to measure the average power delivered to the load? 7
7. (a) Distinguish between an Active and a Passive transducer. Give an example each of a passive and active temperature transducer. 6
- (b) What is the difference between a photoemissive, a photoconductive and photovoltaic cell? Name *one* application of each. 6
- (c) A platinum resistance thermometer has a resistance of $180\ \Omega$ at 20°C . Calculate its resistance at 60°C . The temperature coefficient of resistance (α) at 20°C is 0.00392. 3