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Your Roll No.

5188

B.Sc. (Prog.) PHYSICAL SCIENCES/III Sem. B

Paper ELPT -303

Electronic Instrumentation

Time : 3 Hours

Maximum Marks : 75

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

Attempt any five questions.

Question No. 1 is compulsory.

1. Attempt any five from the following : $3 \times 5 = 15$

(a) What basic precautions should be taken while using an ammeter ?

(b) Define Voltmeter sensitivity giving an expression.

(c) What is the need of trigger circuit in a CRO ?

(d) A Lissajous pattern on the screen is stationary and has 5 horizontal and 2 vertical loops. If the horizontal input frequency is 1000 Hz, find the frequency of vertical signal.

P.T.O.

- (e) What is the purpose of aquadag coating on a CRT screen ?
- (f) Define duty cycle. What is the difference between square wave and pulse wave in terms of duty cycle ?
- (g) What is the difference between active and passive transducer ?
- (h) What is a universal frequency counter ?
2. (a) Explain the working of a series-type ohmmeter. Deduce the expressions for current-limiting resistor and zero-adjust resistor used. How is the effect of battery decay countered ? 8
- (b) What values of shunt resistances are required for using a $50\text{ }\mu\text{A}$ meter movement with an internal resistance of $5\text{ k}\Omega$ for measuring $100\text{ }\mu\text{A}$ and $500\text{ }\mu\text{A}$? 4
- (c) Compare shunt-type and series-type ohmmeters. 3
3. (a) Discuss the working of ramp type digital Voltmeter with the help of block diagram. 10
- (b) What are the advantages of a digital Voltmeter over an analog Voltmeter ? 5
4. (a) Why the electrostatic focusing system in a CR is called an electron lens ? Discuss. 8
- (b) Prove that an electron entering the vertical deflection plates with an initial velocity follows a parabolic path. 7

5. (a) Draw the block diagram of a general purpose CRO. Describe briefly the function of each part. 8
- (b) What is the need of a synchronization of vertical input signal to time base generator ? 3.5
- (c) What are the factors on which the luminance of CRO screen depends ? 3.5
6. (a) What are the different characteristics of a pulse ? Explain its features with the help of a figure. 10
- (b) State with a diagram the working principle of a Sweep Signal Generator. 5
7. (a) What is an electrical transducer and what are its advantages ? 3
- (b) What are the desirable characteristics of any signal source ? 3
- (c) Explain briefly the basic components of a simple frequency counter with the help of a block diagram. 9