

[This question paper contains 3 printed pages.]

1011

Your Roll No.

B.Sc. (Hons.) / II

C

ELECTRONIC SCIENCE – Paper 2.4 (XI)

(Instrumentation)

Time : 3 Hours

Maximum Marks : 38

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

*Attempt five questions in all, including
Question No. 1 which is compulsory.*

1. (a) The output of dc power supply falls from 12V to 11.95V when the ac input drops by 10%. The output also falls from 12V to 11.9V when the total current goes from zero to its maximum level. Determine the percent 'load regulation' and 'line regulation'.
- (b) Explain the terms fluorescence, phosphorescence, persistence and deflection factor.
- (c) A coil of resistance 5Ω is connected in Q-meter circuit and resonance occurs when the oscillator frequency is 500 KHz and resonating capacitor is

P.T.O.

set at 120 pF. Determine the percentage error error introduced in the calculated value of Q if a resistance of 0.02Ω is used across the oscillatory circuit.

- (d) What is the difference between a signal generator and a function generator ?
- (e) Explain the voltmeter-ammeter method for measuring unknown resistance. (5×2)
2. (a) What is the need for current limiting in regulated power supplies ? Explain in detail the circuit for short-circuit shutdown. (5)
- (b) Draw & explain the circuit diagram for a variable reference op-amp regulator. (2)
3. (a) Derive an expression for vertical deflection in a CRT & show how CRT can be used as a linear voltage indicating device. (5)
- (b) Why should the sweep generator run synchronously with the vertical signal source. (2)
4. (a) Explain with the help of a block diagram, the working of a function generator. (4)

- (b) Explain the working of a blocking oscillator. (3)
5. (a) Explain the method used for eliminating the effects of stray capacitances in a bridge circuit. (3)
- (b) Explain the method used for measuring low-impedance components. (4)
6. (a) How can an electronic counter be used to measure time period of an unknown signal? (4)
- (b) What are the various types of measurement errors involved in frequency counters? (3)
7. Write short notes on any **two** of the following :
- (a) Sampling CRO
- (b) True RMS responding voltmeter
- (c) Blondel's Theorem for Power Measurements (7)