

- N.B. :** (1) Question No. 1 is **compulsory**.  
(2) Attempt any **four** questions out of remaining **six** questions.  
(3) Draw **neat diagram** and **sketches**.  
(4) **Figures** to the **right** indicate **full** marks.

1. (a) Explain factors that causes error during Q-measurement. 20  
(b) Explain need of delay line in C.R.O.  
(c) State typical technical specification of Digital voltmeter.  
(d) State the characteristics of Op-Amp.
2. (a) Draw a neat circuit digram and explain the working of an analog electronic voltmeter using FET bridge. 10  
(b) Explain with the help of a neat circuit diagram, the working of a dual slope DVM. 10
3. (a) Discuss the functions of following terms briefly related to C.R.O. :- 10  
(i) Time/div  
(ii) Volts/div  
(iii) Focus  
(iv) Intensity.  
(b) Explain the working of dual trace CRO and double beam CRO. 10
4. (a) What is Lissajous pattern related to CRO ? How they are useful in measuring frequency and phase difference ? 10  
(b) What is a Q of a circuit ? How can a Q-meter be used for the measurement of Impedance of a circuit ? 10
5. (a) With the help of neat block diagram, explain the working of Digital frequency meter. 10  
(b) Describe phase measurement by balanced modulation type. 10
6. (a) Explain with block diagram AF sine and square wave generator. Also state the front panel of a signal generator. 10  
(b) Explain with diagram R-2R ladder type Digital to Analog Converter. 10
7. Solve any **three** :- 20  
(a) Any one method of analog-to-digital converter  
(b) Discuss intensity modulation with reference to C.R.O.  
(c) Storage Oscilloscope  
(d) Beat Frequency Oscillator.