

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

1. (a) State typical technical specifications of digital voltmeter. 5
 (b) Draw Op-Amp based Sample and Hold circuit and explain need of S/H circuit in an A/D converter. 5
 (c) Explain factors involved in selection of voltmeter. 5
 (d) Describe the working of phase measurement by voltage addition method. 5
2. (a) Draw the pattern displayed on CRO in component testing mode for following conditions : 8
 - (i) Open circuit
 - (ii) Diode
 - (iii) Two diodes in series
 - (iv) Capacitor
 - (v) Resistor
 - (vi) Two diodes in anti parallel
 - (vii) Two diodes in back to back mode
 - (viii) Close circuit.
- (b) Draw and explain with the help of neat diagram 3 bit flash ADC. Its advantages and limitations. 8
- (c) Design encoder for 2 bit flash ADC. 4
3. (a) Draw the front panel of CRO and explain functions of various controls. 10
 (b) Draw the Lissajous figures if signal applied to ch1 is 1KHz sine wave and signal applied to ch2 are 1KHz, 2KHz, 3KHz, 4KHz and 5KHz of sine wave. 5
 (c) Explain factors which governs intensity of phosphor screen of CRO. 5
4. (a) Explain with the help of neat diagram working of Function Generator with proper wave forms at various points. 10
 (b) Draw and explain working of SAR type of ADC. Its advantages and limitations. 10
5. (a) Explain in detail construction and working of Cathode Ray Tube. 15
 (b) A 4 1/2 digit voltmeter is used for voltage measurement. 5
 - (i) How 15.684V would be displayed on 2V, 20V, 200V range.
 - (ii) How 0.6935 would be displayed on 2V, 20V range.
6. (a) Explain with the help of neat diagram working of Universal counter - Timer. 10
 (b) Explain need and working of any high frequency CRT. with the help of neat diagram. 10
7. (a) Explain following frequency measurement methods using CRO – 10
 - (i) Spot wheel method
 - (ii) Gear wheel method
 with the help of neat diagram.
- (b) Explain principle and working of true RMS meter using thermocouple with the help of neat diagram. 10