# 22331

**11920**
**3 Hours / 70 Marks** Seat No. | | | | | | | | |

***Instructions :*** (1) All Questions are *compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

**Marks**

**1. Attempt any FIVE of the following :** **10**

(a) Define the term "measurement."

(b) Write the specifications of analog multimeter.

(c) State the working principle of PMMC.

(d) Define resolution and accuracy of digital instrument.

(e) State the need of function generator.

(f) Write the specifications of spectrum analyzer.

(g) List different types of AC and DC bridges.

**2. Attempt any THREE of the following :** **12**

(a) Describe the different types of errors occurs in measurement with one example each.

(b) Explain with sketches the working of ohm meter.

(c) Describe with sketches the working of Lux meter.

(d) Suggest an instrument to measure unknown frequency above 5 MHz and store the result. Justify it.

**3. Attempt any THREE of the following :** **12**

(a) Convert the PMMC movement into a DC ammeter of the range 0 to 100 mA.

(b) Describe with sketches the working of Digital frequency meter.

(c) Explain how CRO is used for measurement of frequency and phase.

(d) Describe the working of Maxwell bridge.

**4. Attempt any THREE of the following :** **12**

(a) Explain with sketches the working of rectifier type of AC voltmeter.

(b) Sketch labelled equivalent circuit diagram of practical ammeter and voltmeter.

(c) Describe with sketches the working of LCR meter.

(d) State the role of oscillator and attenuator in the block diagram of signal generator.

(e) Describe with sketches the working of Digital Storage Oscilloscope.

**5. Attempt any TWO of the following :** **12**

(a) State the importance of calibration. Describe the procedure for calibration of Digital instrument.

(b) Describe with sketches the working of logic analyser. List two specifications and two applications of logic analyser.

(c) Determine the smallest measurable change in the voltage of an analog voltmeter having range 0-200 V with resolution of 0.15% of full scale.

**6. Attempt any TWO of the following :** **12**

(a) Describe with sketches the procedure to measure resistance using wheatstone bridge.

(b) Explain how frequency and amplitude is measured on CRO with one example. What is the use of Lissajous pattern ?

(c) Explain with sketches the working of successive approximation type Digital voltmeter. State its two specifications and two applications.

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