17317

21415

3 Hours/100 Marks

Seat No. | | | | | | | | |

Instructions *: (1)* ***All*** *questions are* ***compulsory****.*
(2) Illustrate your answers with neat sketches ***wherever necessary****.*
(3) ***Figures*** *to the* ***right*** *indicate* ***full*** *marks.*
(4) ***Use*** *of non-programmable Electronic Pocket Calculator is permissible.*

MARKS

1. A) Attempt **any six** of the following :
   a) Define the terms : **2**
      i) Resolution ii) Dead zone.
   b) Draw a circuit diagram of universal shunt voltmeter. **2**
   c) State any two disadvantages of digital instruments . **2**
   d) State principle of digital frequency meter. **2**
   e) Explain in brief function of focusing and accelerating anodes in CRT. **2**
   f) Draw a block diagram of vertical deflection system in CRO. **2**
   g) State need of signal generators. **2**
   h) List one example of time domain and frequency domain instruments. **2**

   B) Attempt **any two** of the following :
   a) List dynamic characteristics of instruments. Define any two. **4**
   b) Describe the different standards. **4**
   c) Draw a diagram of D′Arsonval movement and state its principle. **4**

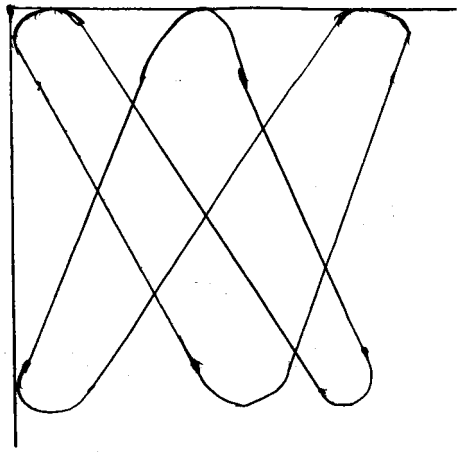
2. Attempt **any four** of the following :
   a) Explain the need of calibration and calibration process. **4**
   b) Draw a block diagram of dual beam CRO. **4**
   c) Describe the waveform generation in CRO. **4**
   d) Draw a circuit of time base generator and explain it. **4**
   e) Explain operation of dual trace CRO, with neat block diagram. **4**
   f) Explain phase measurement using Lissajous patterns. **4**

3. Attempt **any four** of the following :
   a) State detailed classification of errors. **4**
   b) A basic D′Arsonval movement with an internal resistance of 50 Ω and a full scale deflection current of 2 mA is to be used as a multirange voltmeter. Design a series of string of multipliers to obtain the voltage ranges of 0 – 10 V, 0 – 50 V. **4**
   c) Derive the expression for shunt resistors required in multirange Ammeter. **4**

P.T.O.

MARKS

d) The Lissajous pattern observed on CRO is as shown in figure. Calculate the vertical input frequency if horizontal input frequency is 1500 Hz. **4**



e) Draw a block diagram of function generator. State function of each block. **4**

f) Write two uses of **4**
1) Video pattern generator 2) Function generator.

4. Attempt **any four** of the following :
   a) State classification of analog meters. **4**
   b) Draw a diagram of full wave rectifier type AC voltmeter. Explain its working. **4**
   c) Derive the relation between deflection torque in PMMC instruments. **4**
   d) Explain the loading effect in voltmeters. How to avoid it ? **4**
   e) A 2 mA meter with an internal resistance of 100 Ω is to be converted to 0 – 150 mA ammeter. Calculate the value of shunt resistance required. **4**
   f) Draw a circuit diagram of Ayrton shunt type Ammeter. What is the advantage of it over normal shunt type ammeter ? **4**

5. Attempt **any four** of the following :
   a) State any four applications of CRO. **4**
   b) Draw a basic block diagram of digital storage CRO . Write the function of each block. **4**
   c) Draw a block diagram of pattern generator. Explain generation of cross hatch pattern. **4**
   d) Draw the block diagram of Logic analyzer. List the types or modes of displays in it. **4**
   e) Draw a block diagram of wave analyzer. Write its principle. **4**
   f) Describe the operation of spectrum analyzer with neat diagram. **4**

6. Attempt **any four** of the following :
   a) Compare analog and digital meters (any 4 points) : **4**
   b) Draw a block diagram of digital multimeter. **4**
   c) What do you mean by $3\frac{1}{2}$ digit display ? **4**
   d) Draw a block diagram of digital frequency meter. Explain its operation. **4**
   e) Explain SAR type digital voltmeter with neat labelled diagram. **4**
   f) Write any four specifications of DMM. **4**
