17317

15162

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) Assume suitable data, if ***necessary****.*
(5) Use of Non-programmable Electronic Pocket Calculator is ***permissible****.*

Marks

1. A) Attempt **any six** of the following : **12**

a) Define sensitivity and reproducibility. **2**

b) Enlist the specifications of analog DC voltmeter. **2**

c) State how DMM can be used to check diode and transistor. **2**

d) Define RMS value and peak to peak value. **2**

e) List the four applications of CRO. **2**

f) List out any four features of logic analyzer. **2**

g) State the function of delay line. **2**

h) Define wave analyzer and state its need. **2**

B) Attempt **any two** of the following : **8**

a) State the reason for ammeter never connected in shunt across a source of EMF. **4**

b) State how frequency and phase can be measured using Lissajous pattern. **4**

c) Explain primary standard and secondary standard. **4**

2. Attempt **any four** of the following : **16**

a) Describe Gross error, systematic error and random error. **4**

b) Design multirange DC ammeter for $R_m = 100\,\Omega$, $I_m = 1$ mA and required current ranges are 0-20 mA, 0-100 mA, 0-200 mA. **4**

c) Explain the working of linear ramp type DVM. **4**

d) Draw the block diagram of horizontal deflection system. State the role of trigger circuit and time base generator in CRO. **4**

e) Draw the circuit of multirange AC voltmeter and explain its working. **4**

f) Explain the working of standard RF signal generator and explain it. **4**

P.T.O.

Marks

3. Attempt **any four** of the following : **16**

a) Draw constructional diagram of PMMC meter and explain working principle. **4**

b) Draw labelled diagram of CRT and explain working of CRT. **4**

c) Draw diagram of LCR-Q meter and how different parameters are measured using it. **4**

d) Explain different dynamic characteristics of instrument. **4**

e) Explain the working of Ayrton Shunt type DC ammeter with the help of diagram. **4**

f) Draw the block diagram of pulse generator and explain its operation. **4**

4. Attempt **any four** of the following : **16**

a) Define calibration of instrument and explain need of calibration. **4**

b) Draw the circuit of DC voltmeter and derive the equation of series resistance. **4**

c) Compare digital instrument with analog instrument. (4 points). **4**

d) Explain the working of single beam dual trace CRO with the help of block diagram. **4**

e) Draw the block diagram of spectrum analyzer. State any four application of spectrum analyzer. **4**

f) Explain the operation of digital frequency meter with the help of block diagram. **4**

5. Attempt **any four** of the following : **16**

a) Define sensitivity and loading effect of voltmeter. **4**

b) Draw the block diagram of digital multimeter and sate how i) resistance ii) current is measured. **4**

c) Draw the block diagram of dual beam dual trace CRO and state function of each block. **4**

d) Describe working of distortion factor meter with the help of diagram. **4**

e) Draw the labelled block of dual slope integrating type DVM. State its operation. **4**

f) List out any four front panel control of basic CRO with their functions. **4**

6. Attempt **any four** of the following : **16**

a) Explain the working of analog AC ammeter with the help of diagram. **4**

b) Compare successive approximate type DVM with linear ramp type DVM (4 points). **4**

c) Describe the methods of measurement using CRO : **4**

i) Voltage measurement ii) Current measurement

ii) Timp period measurement iv) Frequency measurement.

d) Explain working of frequency selective wave analyzer with the help of diagram. **4**

e) Draw the block diagram of digital storage oscilloscope. Write function of each block. **4**

f) Draw the block diagram of video pattern generator. State the uses of various patterns generated by pattern generator. **4**