17317

21314

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****.*
(6) Mobile Phone, Pager and any other Electronic Communication devices are ***not*** *permissible in Examination Hall.*

MARKS

1. A) Attempt **any six** : **12**

a) List the dynamic characteristics of an instrument.

b) List the parameters that can be measured by analog multimeter.

c) State the applications of digital voltmeter.

d) List any four applications of CRO.

e) What is the role of schmitt trigger in the block diagram of pulse generator ?

f) State any four applications of wave analyzer.

g) State the function of delay line.

h) What is role of mirror in analog type instrument ?

B) Attempt **any two** : **8**

a) Compare absolute instruments and standard instruments.

b) Draw the constructional diagram of PMMC meter and explain its working principle.

c) Differentiate digital instruments over with analog instruments.

P.T.O.

MARKS

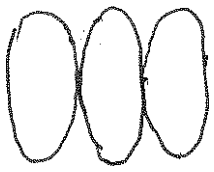
2. Attempt **any four** : **16**

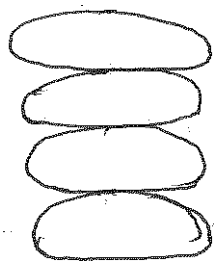
a) Draw the circuit of basic Q-meter. Explain its working.

b) Draw a neat and labelled diagram of CRT.

c) Draw the block diagram of spectrum analyzer and explain its operation.

d) Calculate the frequency of vertical input for an oscilloscope which displays the following Lissajous figures.
(Assume Horizontal input frequency is 10 KHz)

a) 

b) 

e) Draw the circuit of multirange A.C. voltmeter and explain its working.

f) State any two types of systematic error. How does they occur ? What are the remedies to avoid them ?

3. Attempt **any four** : **16**

a) A D.C. voltmeter uses 50 μA and having an internal resistance of 400 Ω. Calculate the value of multiplier on ranges :

i) 10 V

ii) 15 V

iii) 20 V

iv) 25 V

b) Draw the block diagram of dual beam oscilloscope. What are the different methods used to generate two different beams ?

c) Draw the block diagram of pulse generator. Give two applications of it.

MARKS

d) Draw the block diagram of digital multimeter. List its four applications.

e) What is meant by calibration of an instrument ? State its concept and need in detail.

f) Draw the block diagram of dual slope type digital voltmeter. Draw the waveform of voltage verses time.

4. Attempt **any four** : **16**

a) What is use of Q-meter ? Draw circuit diagram of Q-meter.

b) Draw the basic block diagram of CRO. State which material is used for coating for a Fluorescent screen.

c) Draw the circuit of basic D.C. ammeter. Derive equation for shunt resistance.

d) Define the term :

i) Sensitivity of voltmeter ii) Loading effect of voltmeter

e) How we can classify the electronic Instruments ? List the static characteristics of Instrument.

f) How distortion factor meter works ? Explain with neat sketch.

5. Attempt **any four** : **16**

a) Draw the block diagram of Digital Frequency Meter. State the function of Schmitt trigger in DFM.

b) Describe the working of Frequency selective wave analyzer.

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

d) Draw the block diagram of Digital Storage Oscilloscope. Give its applications.

e) Draw the circuit of basic D.C. voltmeter. Explain how it can be converted into multirange D.C. voltmeter.

f) Differentiate between single beam dual trace and dual beam dual trace CRO.

MARKS

6. Attempt **any four** : **16**

a) Explain how phase can be measure on CRO using Lissajous patterns.

b) Draw the block diagram of horizontal deflection system. State the role of trigger circuit and time base generator in oscilloscope.

c) Why ammeter is never connected across a source of e.m.f. ? Justify your answer.

d) Design multirange D.C. ammeter for $R_m = 100\,\Omega$ and $I_m = 1$ mA and required current ranges are 0-20 mA, 0-100 mA and 0-200 mA.

e) Compare analog and digital multimeter on the basis of

i) Display

ii) Resolution

iii) Function available

iv) Power consumption

f) Draw the block diagram of function generator. State the function of diode wave shaping circuit.
