Total No. of printed pages = 8

Et-402/ET&M/4th Sem/2018/M

ELECTRONICS TEST AND MEASUREMENT

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

PART – A

A. Answer true or false : $1 \times 5 = 5$

1. Multimeter can be used only for low resistance measurement.

   (a) True

   (b) False

2. CRO is voltage measuring device.

   (a) True

   (b) False

3. Sweep generator is a time base generator.

   (a) True

   (b) False

[Turn over

4. Transducer is not used to convert a physical quantity into an electrical signal.

   (a) True

   (b) False

5. A bolometer is a device for measuring the power of incident electromagnetic radiation.

   (a) True

   (b) False

B. Fill up the gaps : $1 \times 5 = 5$

1. There are _____ number(s) of vertical inputs exist in a dual trace oscilloscope.

2. Transducer produces a proportional _____. (current, voltage, resistance, power)

3. In function generator, the output waveform of integrator is _____.

4. _____ part is called as heart of CRO.

5. If the two input waveforms of equal amplitude and 90 degree phase difference is applied to the CRO, then the Lissajous patterns obtained will be _____.

C. Choose the correct answers : $1 \times 10 = 10$

1. Electronic multimeter measures

   (a) voltage, current and resistance

   (b) voltage and current

   (c) current and power

   (d) energy and power

2. Principally CRO is a

   (a) Ammeter

   (b) Voltmeter

   (c) Wattmeter

   (d) Watt-hour meter

3. The sweep generator of a CRO is used to produce

   (a) Sinusoidal voltage for the horizontal deflection of electron beam

   (b) Saw tooth voltage for the vertical deflection of electron beam

   (c) Sinusoidal voltage for the vertical deflection of electron beam

   (d) Saw tooth voltage for the horizontal deflection of electron beam

4. The Lissajous patterns help in the measurement of

(a) Phase difference between two sine waves

(b) Frequency of one waveform if the frequency of other waveform is known

(c) Both (a) and (b) above

(d) None of the above

5. Digital multimeter is used for

(a) measuring AC and DC current, voltage and resistance

(b) measuring AC current and voltage

(c) measuring DC current and resistance

(d) measuring AC voltage and resistance

6. CRO is used in radar for

(a) studying the pattern of flights

(b) visualizing a target

(c) measuring voltage

(d) determining the distance between source and destination

7. What is a data acquisition system ?

(a) System used for data processing, conversion and transmission

(b) Accepts data as an input

(c) Removes noise

(d) Boosts the signal

8. Transducer produces a

(a) proportional current

(b) proportional voltage

(c) proportional resistance

(d) proportional power

9. A spectrum analyzer is used to measure

(a) frequency

(b) loss angle of a dielectric

(c) insulating resistance

(d) harmonics

10. The full range of audibility in audio frequency oscillator is

(a) 0 to 20 Hz

(b) 20 Hz to 2 kHz

(c) 20 Hz to 20 kHz

(d) 20 Hz to 20 MHz

D. Match part A with B $1\times5=5$

A	B
(a) Multiplexer	(i) displays the amplitude of an input.
(b) Sweep generator	(ii) measures the total harmonic power present in the test wave.
(c) Spectrum analyzer	(iii) accepts multiple inputs signal versus frequency.
(d) Distortion analyzer	(iv) is used for low Microwave power measurements.
(e) Bolometer	(v) is a time base generator.

PART – B

2. Answer in short : $2\times5=10$

(a) What is a Cathode Ray Oscilloscope (CRO) ?

(b) What is VTVM ?

(c) What is aquadag ?

(d) What is a Lissajous pattern ?

(e) What is total harmonic distortion ?

3. Answer any *five* questions : 3×5=15

(a) List three disadvantages of Analog multimeter.

(b) Draw a neat diagram of CRT and label it.

(c) What is a DSO ? What are its advantages ?

(d) What is a signal generator ? What are its applications ?

(e) What is Data Acquisition System ? Name two types of transducer.

(f) What is IEEE bus interface ? Draw a neat diagram of IEEE bus interface.

4. Answer any *five* questions : 4×5=20

(a) Draw neat block diagram of CRO and explain any two blocks.

(b) Describe the working of any one type of electronic multimeter.

(c) Explain the working of function generator with block diagram.

(d) Explain the method of measuring frequency of an unknown signal with the help of Lissajous Pattern.

(e) Describe in brief the working of harmonic analyzer with block diagram.

(f) Explain how Bolometer can be used for Microwave power measurements.