Total No. of printed pages = 7

Et-402/ET&M/4th Sem/2017/N

ELECTRONIC TEST AND MEASUREMENT

Full Marks – 70

Time – Three hours

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

PART – A

1. Fill in the blanks : 1×10=10

   (i) In EMM power consumption is ————.

   (ii) In case of Chopper amplifier type voltmeter, the DC input voltage is chopped to a low frequency, 200Hz to ———— AC.

   (iii) The principle of operation of the Ramp type DVM is based on the measurement of ———— it takes for a linear ramp voltage.

[Turn over

(iv) In case of DMM, power supply is _____.

(v) C.R.O is a versatile laboratory instrument used for display, measurement and _____ of waveform.

(vi) In CRT the pre-accelerating and accelerating anodes are connected to a common positive high voltage of about _____ V.

(vii) The Duty cycle is defined as the ratio of the pulse width and the _____.

(viii) The measure of distortion represented by a particular harmonic is simply the ratio of harmonic to that of the _____ harmonic.

(ix) The calorimetric method for measurement of large amount of RF power uses the principle, that a RF power may be directly converted into _____.

(x) Bolometric measurements are based on the dissipation of the _____ power in Bolometer.

2. Write true or false : 1×5=5

(i) The EMM has high input impedance than conventional one.

(ii) The input to the horizontal amplifier in C.R.O is a square wave.

(iii) The shape of Lissajous pattern is a circle when two sine waves of the same frequency and amplitude and in phase.

(iv) Focus of the display waveform can be changing the potential of the focusing anode.

(v) The signal generator can be phase locked to an external signal source.

3. Write the answer in one sentence each : 1×5=5

(a) What is VTVM ?

(b) What is sweep voltage ?

(c) What is the full form of IEEE ?

(d) What is aquadag coating ?

(e) What is C.R.O probe ?

4. Choose the correct answer : 1×5=5

(a) If the frequency of the horizontal signal is 1 KHz and number of horizontal and vertical tangencies are respectively 3 and 2, what will be the unknown signal frequency ?

(i) 2 KHz (ii) 6 KHz

(iii) 1.5 KHz (iv) 1 KHz

(b) In $3\frac{1}{2}$ digit digital meter, the maximum display will be

(i) 1110 (ii) 0999

(iii) 9990 (iv) 0111

(c) In modern signal generator the RF oscillator output(max) is

(i) 30 MHz (ii) 2 MHz

(iii) 80 MHz (iv) 34 MHz

(d) In integrating type DVM output voltage is given by

(i) $\frac{1}{RC}\int Vi.dt$

(ii) $\frac{1}{RC}\int Vc.dt$

(iii) $\frac{1}{RL}\int Vi.dt$

(iv) None of the above

(e) In spot wheel method if high frequency is 10 MHz and numbers of bright spot are 5, then what will be the unknown signal frequency ?

(i) 50 MHz

(ii) 2 MHz

(iii) 0.5 MHz

PART – B

1. Answer any *five* questions : 2×5=10

(a) What is DMM and Analog multimeter ?

(b) What are the advantages of EMM over VOM ?

(c) How beam of electron are generated in CRT ?

(d) What are the differences between dual trace and dual beam C.R.O ?

(e) What is function generator and what are the application of it ?

(f) What do you mean by wave analysis and harmonic distortion analyzer ?

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

(a) Draw the neat diagram of CRT and label each component.

(b) What are the different types of DVM and the errors in DMM measurement ?

(c) What are the different methods for frequency measurement in C.R.O ? Draw the Lissajous pattern for two sine waves of same frequency and amplitude but phase difference is 30° or 330°.

(d) What is data acquisition system ? Describe briefly.

(e) Write what you know about Bolometer.

(f) Describe how time period can be measured with the help of frequency counter.

3. Answer any *four* questions : 5×4=20

(a) Describe the working of bridge type electronic multimeter using BJT.

(b) Describe the working of ramp type DVM with neat diagram.

(c) Draw the block diagram of C.R.O and explain the working of horizontal and vertical deflection plate assembly.

(d) Explain with diagram the working of AF signal generator.

(e) What is spectrum analyzer ? Draw the block diagram.

(f) Explain IEEE bus interface with neat diagram.