

Total number of printed pages-5

53 (IE 504) ELIN

2017

ELECTRONIC INSTRUMENTATION

Paper : IE 504

Full Marks : 100

Time : Three hours

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

Answer any five questions.

1. (a) Answer the following : 2
 - (i) A galvanometer in series with a high resistance is called _____.
 - (ii) Sensitivity of a multimeter is given in _____.
- (b) Differentiate between analog and digital voltmeter. 3
- (c) What is Power Meter? Explain Induction wattmeter with a neat diagram. Also give the advantages of Induction wattmeters. 1+4+2=7

Contd.

- (d) Describe the block diagram of the vector voltmeter. 8
2. (a) What is Q-meter? Explain different measurement methods of Q-meter. 1+9=10
- (b) When a Q-meter circuit is in resonance with $V = 100mV$, $R = 5\Omega$, and $X_L = X_C = 98\Omega$, determine the coil Q and the voltmeter indication. 2
- (c) Explain capacitance measuring meter using the phase shift characteristics of RC circuit. Also give the Taylor expansion for phase angle. 3
- (d) Explain the block diagram of a true RMS-reading voltmeter. 5
3. (a) Give the characteristics of Signal Generator. 3
- (b) Explain the role of Colpitt's Oscillator using BJT for sine wave generator. 5

- (c) What is Attenuator? How does attenuator reduces power if a signal is passed through two attenuators? 2
- (d) The resonant circuit of a tuned collector transistor oscillator has resonant frequency of 5MHz. If the value of capacitance is increased by 50%, calculate the new resonant frequency. 2
- (e) Explain the need of Linearizing circuit for a sweep generator. 4
- (f) Describe free running multivibrator for the generation of pulses. 4
4. (a) How does heterodyne harmonic analyzer overcome the difficulties of the tuned circuit harmonic analyzer? 5
- (b) Name the major sections present in fundamental suppression HD analyzer. Also give the function of Rejection amplifier. 2+3=5
- (c) Frequency range of spectrum analysis is _____. 1

- (d) Explain the block diagram of CRO. 5
- (e) Name *three* controls associated with the operating voltages of the Cathode Ray Tube with their functions. 4
5. (a) Define following : 2+2=4
- (i) Dual Trace Oscilloscope
- (ii) Distributed parameter delay line.
- (b) Describe the role of Hall effect sensor in current probe of oscilloscope. 4
- (c) Classify storage CRT. What is secondary emission ratio ? Explain with example. 2+3=5
- (d) Explain sampling oscilloscope with a simplified block diagram. 7
6. (a) Answer the following : 2
- (i) Heart of CRO is _____.
- (ii) The sweep generator of a CRO is used to produce _____.

(b) With a schematic view explain bistable storage tube. 3

(c) Explain schematic representation of the IEEE 488 instrumentation bus. 8

(d) Explain X-Y recorders with its application. 7

7. Write short notes on following : **(any four)**
5×4=20

(i) Balanced bridge DC amplifier

(ii) Phase-locked loop

(iii) Wideband Sweep Generator

(iv) Function Generator

(v) Magnetic Tape Recorders

(vi) Spectrum Analyzer.