53 (IE 504) ELIN

2018

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)* Differentiate between analog and digital multimeter. 4

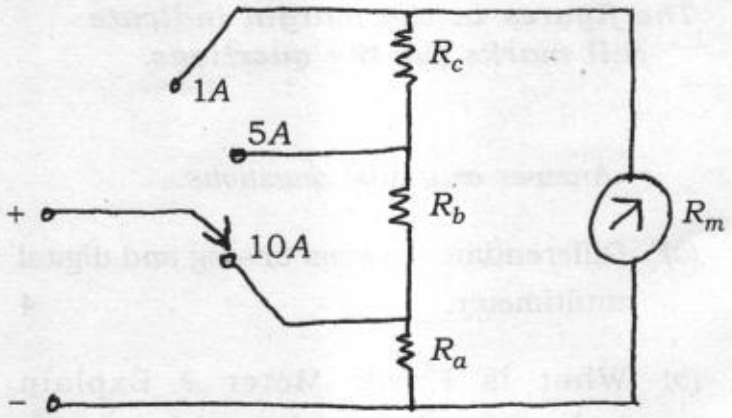
   (b) What is Power Meter ? Explain Induction Wattmeter with a neat diagram. 1+5=6

   (c) With a neat block diagram explain the vector impedance meter. 10

2. *(a)* Explain the block diagram of true RMS-reading voltmeter. 6

(b) What is Q-meter ? Explain different measurement methods of Q-meter. 1+6=7

(c) Design an Ayrton shunt to provide an ammeter with current ranges $1A$, $5A$ and $10A$. If coil resistance $R_m = 50\Omega$ and FSD current $1mA$ is used for following configuration. 7



3. *(a)* Give the characteristics of Signal Generator. 3

(b) Explain the role of Colpitt's oscillator using BJT for sine wave generator. 6

(c) What is eddy-current ? 1

(d) Explain balanced-bridge dc amplifier using FETs. 7

(e) Explain the inductance measuring meter using the phase shift characteristics. What is the phase shift of the circuit ? 3

4. (a) Explain the block diagram of general purpose spectrum analyzer. 6

(b) Describe free running multivibrator for the generation of pulses. 5

(c) Explain the need of Linearizing circuit for a sweep generator. 5

(d) What is the role of impedance converter and rejection amplifier in fundamental supression distortion analyzer ? 4

5. (a) Explain the following : 5+5=10

(i) Hall effect sensor in oscilloscope probe.

(ii) Electrostatic focusing of CRT.

(b) Explain the block diagram of general purpose oscilloscope. 7

(c) Name the control knobs to control beam density in oscilloscope. 3

6. (a) Explain the simplified block diagram of the sampling circuitry of oscilloscope. 7

(b) Describe the operation of magnetic tape recorder. 5

(c) Discuss briefly the working of IEEE488 instrumentation bus system. 8

7. Write short notes on the following : 5×4=20

(i) Function Generator

(ii) Phase-locked loop

(iii) X–Y recorders

(iv) Bistable storage tube.
