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)* Explain the working principle of PMMC instrument and also write the equation for the developed torque. 6

   (b) A moving coil instrument gives full scale deflection with 15*A*. The resistance of coil is 5Ω. How to convert this instrument into an ammeter to read upto 2*A*? How to convert this instrument to read upto 30*V*? 2

   (c) Name different torque in PMMC instrument. 3

   (d) With the help of neat block diagram explain the working principle of vector voltmeter. 9

Contd.

2. *(a)* Discuss the uses of Electronic instrumentation. 4

(b) What is Q meter? Explain different methods for connecting unknown components to the test terminals of Q meter. 1+9=10

(c) Explain induction wattmeter with phasor diagram. 6

3. *(a)* Explain the block diagram of Simple Sine Wave Generator. 3

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

(c) What is sweep-frequency generator? Explain the importance of linearzing circuit for a sweep generator. 3+4=7

(d) Describe free running multivibrator for the generation of pulses. 4

4. *(a)* Explain the block diagram of fundamental suppression distortion analyzer. 8

(b) What are the limitations for tuned circuit harmonic analyzer? 2

(c) What is the frequency range for VHF spectrum analyzer? Explain the block diagram of general purpose spectrum analyzer. 6

(d) What are the frequencey instabilities found in spectrum analyzer for narrow frequency ranges? Explain. 4

5. *(a)* Explain the block diagram of general purpose oscilloscope. 7

(b) Explain the following: 4+4+3+2=13

(i) Lumped parameter and Distributed parameter delay line

(ii) Hall effect sensor in oscilloscope probe

(iii) Dual trace oscilloscope

(iv) Uncompensated attenuator.

6. *(a)* Explain the simplified block diagram of the sampling circuitry. Give disadvantages of the storage cathode ray tube. 10

(b) Discuss briefly the working of IEEE 488 instrumentation bus system. 10

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

(i) Function generator

(ii) Wavemeter

(iii) Balanced bridge dc amplifier

(iv) Digital multimeter

(v) X-Y recorders.
