

Total number of printed pages-4

53 (IE 504) ELIN

2019

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) Define the following terms :

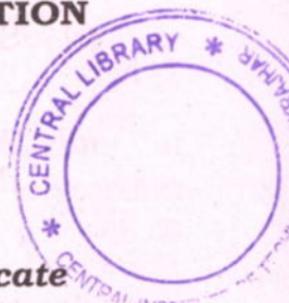
2+1+1=4

- (i) Analog Voltmeter
- (ii) Accuracy
- (iii) Precision.

(b) With the help of a neat block diagram, explain the working principle of vector voltmeter. 10

(c) What is power meter? Explain Induction wattmeter with a neat diagram. Also give the advantages of induction wattmeters. 1+4+1=6

Contd.



2. (a) Explain the working principle of PMMC instrument and also write the equation for the developed torque. 6
- (b) Name different torques present in PMMC instrument. 3
- (c) Sensitivity of a multimeter is given in . 1
- (d) What is Q-meter? Explain different measurement methods of Q-meter. 1+9=10
3. (a) Explain capacitance measuring meter using the phase shift characteristics of RC circuit. Also give the Taylor expansion for phase angle. 3
- (b) Explain the block diagram of simple sine wave generator. 3
- (c) Explain the role of Colpitt's oscillator using BJT for sine wave generator. 6
- (d) A Colpitts oscillator is designed with $C_1 = 100\text{pF}$ and $C_2 = 7500\text{pF}$. The inductance is variable. Determine the range of inductance values, if the frequency of oscillation is to vary between 950kHz and 2050kHz. 4
- (e) Describe free-running multivibrator for the generation of pulses. 4
4. (a) What is sweep-frequency generator? Explain the importance of linearizing circuit for a sweep generator. 3+4=7
- (b) Explain the block diagram of fundamental suppression distortion analyzer. 8
- (c) What are the frequency instabilities found in spectrum analyzer for narrow frequency ranges? Explain. 4
- (d) Frequency range of spectrum analysis is . 1
5. (a) Explain the block diagram of CRO. 6
- (b) Define the following : 3+4+2=9
 - (i) Dual trace oscilloscope
 - (ii) Lumped parameter and distributed parameter delay line
 - (iii) Uncompensated attenuator.

- (c) Classify storage CRT. What is secondary emission ratio ? Explain with example.
2+3=5
6. (a) Explain schematic representation of the IEEE 488 instrumentation bus. 8
- (b) Describe the operation of magnetic tape recorder. 6
- (c) What is X-Y recorder ? Explain. 6
7. Write short notes on the following :
(any four) 5x4=20
- (i) Data loggers
- (ii) Wavemeter
- (iii) DMM
- (iv) Function generator
- (v) True RMS-reading voltmeter.

