ELECTRONIC INSTRUMENTS

Time : 3 Hours] [Total Marks : 100

Note : Attempt all questions. All questions carry equal marks.

1 Attempt any four parts of the following : 5x4=20

(a) State the different types of methods to measure the frequency and phase. Explain at least one method to measure the frequency.

(b) Which method is most useful to measure the power ? Explain with suitable diagram.

(c) What is harmonic distortion? Draw the block diagram of harmonics distortion measurement techniques and explain the working principle.

(d) What method can be used to increase the frequency range of a frequency counter? How can this be achieved without degrading the accuracy of the counter ?

(e) Explain the measurement of characteristic of amplifier and receiver.

(f) State the different types of amplifying element with their advantage and disadvantage.
2 Attempt any **four** parts of the following: 5x4=20
(a) State four types of electrical pressure transducer and describe one application of each type.
(b) Under what condition is a dummy strain gage used and what is the function of that gage?
(c) How are the thermocouples used to measure the temperature? Explain.
(d) Draw the block diagram of spectrum analyzer and give the main application of spectrum analyser.
(e) What is the advantage and disadvantage of InkJet recorders?
(f) What is the difference in spectrum analyser and network analyser? Explain in detail.

3 Attempt any **two** parts of the following: 10x2=20
(a) What is the working principle of ECG machine? What is the clinical application and advantage of ECG machine?
(b) Explain with block diagram of various parts of a CRT. What extra components are needed to make it a CRO? Explain how would you measure frequency using CRO.
(c) Draw the block diagram of storage oscilloscope. Explain the working of each block. What is basic difference between ordinary oscilloscope and storage type oscilloscope?

4 Attempt any **two** parts of the following: 10x2=20
(a) What is analog and digital Data Acquisition systems? Draw the block diagram of Data Acquisition system and explain each block.

V-3077] 2 [Contd..
(b) What are the parameters measured using ophthalmology instruments and optholmoscope? Explain with block diagram the principle of measurement.

(c) What is Tonometer? How tonometer is useful to human life? Explain with suitable diagram.

5 Attempt any four parts of the following: \( 5 \times 4 = 20 \)

(a) Cardiac Pacemaker

(b) Laser Application in machine

(c) Application of X-rays

(d) Radiographic Diagnostic

(e) Defibrillator

(f) Colour printers.