2018-20

Time : 3 hours

Full Marks : 70

Candidates are required to give their answers in their own words as far as practicable.

The questions are of equal value.

*Answer **five** questions in which Q. No. 1 is compulsory.*

1. Answer any **four** of the following :
   (a) Give an idea of CRO.
   (b) Explain the principles of Lissajous figures.
   (c) Give an idea of Molecular Dynamics.
   (d) What is Monte-Carlo ? Explain.
   (e) Give an idea of Lock-in detector.
   (f) Explain the principle of testing of transistors.
   (g) What is NAMD ?
   (h) What is VMD ?

2. What is Least square curve fitting ? Describe Linear Least square fitting method to a given data (x_i, y_i), i = 1, 2, ... m.

3. Describe the principle and working of :
   (a) Vibrational transducer.
   (b) Magnetic field transducers

4. Describe in detail the star and delta connections of resistors and capacitors.

5. Describe the principle and working of digital multimeters.

6. Explain with principle, the working of series and shunt type zener diode voltage regulator.

7. Discuss the principle and working of STM.

8. Explain the working of RF oscillator with circuit diagram.

9. Write notes on any **two** of the following :

   (a) FORTRAN

   (b) SCILAB

   (c) AFM

   (d) Filtering and Noise reduction