M.Sc. (Part–I) Semester–I (C.B.C.S. Scheme) Examination

ELECTRONICS

(Bio-Medical Instrumentations)

Paper–1 ELE 3

Time : Three Hours] [Maximum Marks : 80

N.B. :— (1) All questions carry equal marks.

(2) Solve **one** question from each alternative.

(3) Draw neat sketches wherever necessary.

1. (a) Explain the various components in basic medical instrumentation system. 8
   (b) Explain the concept of biometrics in detail. 8

OR

   (p) Explain the various components in intelligent medical instrumentation system. 8
   (q) Explain the various sources of biomedical signals. 8

2. (a) Explain the origin of various bioelectric signals. 8
   (b) Explain the various electrodes used in ECG instrument in detail. 8

OR

   (p) Explain various electrodes used in EEG instrument in detail. 8
   (q) Explain Silver-Silver Chloride Electrodes. 8

3. (a) Explain the construction and operation of VCG (Vectorcardiograph) with block diagram. 8
   (b) Explain the construction and operation of EMG (Electromyograph) with block diagram. 8

OR

   (p) Explain the construction and operation of ECG (Electrocardiograph) with block diagram. 8
   (q) Explain the construction and operation of EEG (Electroencephalograph) with block diagram. 8

4. (a) Explain the basic NMR components. 8
   (b) State the advantages of NMR. 4
   (c) What is MRI ? 4

OR

   (p) Explain the principle of NMR imaging system. 8
   (q) Explain biological effect of NMR imaging. 8

5. (a) Explain Cobalt-60 machine with block diagram. 8
   (b) Explain X-ray tomography machine. 8

OR

   (p) Explain the possible development of Betatron instrument. 8
   (q) Explain the construction and operation of high voltage X-ray machine. 8