

B.E. / B.Tech. Instrumentation Engineering (Model Curriculum) Semester-VI
IN602M / BIOMEDICAL1 - Biomedical Instrumentation

P. Pages : 2

Time : Three Hours



GUG/S/25/14029

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Explain problems encountered in measuring the parameters of living system? What are performance requirements of medical instrumentation system? **8**
- b) Define Man-Instrument system? Explain in detail components of Man-Instrument system with suitable block diagram. **8**

OR

2. a) Elaborate the term intelligent medical instrumentation system with suitable diagram? **8**
- b) Define following characteristics of instruments Accuracy, Precision, Hysteresis, Sensitivity, Linearity, Resolution, Drift, Lag, Speed of response, Fidelity, Dynamic error. **8**
3. a) Write short note on any two: **8**
- a) Resting potential
 - b) Action potential
 - c) Biochemical transducer
- b) Define Nernst law. Describe polarization and depolarization in relation with resting and action potential. **8**

OR

4. a) Explain any two types of electrodes in detail with suitable diagram. **8**
- a) Surface electrodes
 - b) Depth and Needle electrodes
 - c) Floating type electrode
- b) Describe the equivalent circuit diagram of bio potential electrode interface? **8**
5. a) Describe Ultrasonic Doppler blood flow measurement with illustrations? **8**
- b) What is need for Pacemakers? Explain with block diagram. Which battery mostly used in pacemakers? **8**

OR

6. a) State importance of cardiac Defibrillators? With neat diagram explain DC Defibrillator? **8**

- b) Explain in details methods of Non-invasive BP measurement technique. **8**
a) Ascultatory method with Korotkoff sounds.
b) Oscillometric method with suitable graphical representation.
7. a) With neat block diagram illustrate how electromyogram is recorded from human body? **8**
b) Write short note on: **8**
a) Pneumography.
b) Somatic nervous system.

OR

8. a) Illustrate the working of spirometer with the experimental setup? **8**
b) Explain the graph related to volume and capacities of lung. Give terms related with it. **8**
9. a) Explain how GFI and LIM devices protect against electrical hazards? **8**
b) What is Computer Tomography? Explain its scanning procedure with complete diagram. **8**

OR

10. a) What is principle of Ultrasonic imaging? Differentiate between Haemo dialysis and Peritoneal dialysis? **8**
b) Explain the production of X-rays with suitable block diagram of X-ray machine? **8**
