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- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data whenever necessary.
 10. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Explain in detail the cardiovascular system of the human body. 7
- b) Explain basics and waveform of Bioelectric signals. 7

OR

2. a) Explain basic medical Instrumentation system with diagram. 8
 - b) Write short note on: ECG. 6
3. a) Differentiate between Biosensors and Smart sensors. 6
 - b) What is the significance of Pressure transducers in Biomedical Instrumentation? Explain in detail. 7

OR

4. a) Explain in detail displacement transducers used in Biomedical system. 8
 - b) With neat schematic explain the working of any one photoelectric transducer. 5
5. a) Explain working principle of Electroencephalography with suitable diagram. 7
 - b) Explain in detail Electrocardiograph and its limitation. 6

OR

6. a) Draw and Explain block diagram of Biomedical recorder. 8
- b) Write a short note on: Phonocardiograph. 5

7. a) Explain in detail Blood Pressure measurement system. Also give its advantages. 8
b) Write short note on: cardiac monitor. 5

OR

8. a) Explain in detail the importance of Bedside Patient monitoring system. 7
b) Explain the importance of measurement of pulse rate in the patient monitoring system. 6
9. a) What is the practical use of MRI? Also Explain in detail MRI System components. 8
b) Explain in detail Ultrasonic basic Pulse-echo apparatus. 6

OR

10. Write short note on: **any two**. 14
a) X-Ray machine
b) CT scanning
c) MRI
11. a) Explain various Electric shock Hazards in Biomedical equipments. 7
b) Write short note on: safety code of Electrical Equipment. 6

OR

12. a) Explain various testing schemes of Biomedical Equipments. 7
b) Explain in detail Electrical safety Analyzer. 6
