



- 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. Diagrams and chemical equations should be given whenever necessary.
 11. Illustrate your answers whenever necessary with the help of neat sketches.
 12. Use of non programmable calculator is permitted.

1. a) Explain origin at Biomedical signals. 7
b) Explain cardiovascular and respiratory system with diagram. 7

OR

2. a) Explain Basics and waveforms of Bioelectric signals. 7
b) Explain Basic medical instrumentation system with diagram. 7
3. a) Explain Photoelectric transducers as used in Biomedical system. 8
b) Explain Displacement transducer as used in Biomedical system. 6

OR

4. a) Explain smart sensors with diagram. 7
b) Explain pressure transducer used in Biomedical system. 7
5. a) Explain phonocardiograph with its applications. 7
b) Explain advantages and disadvantages of Biomedical recorders. 6

OR

6. a) Explain advantages, applications and disadvantages of ECG. 6
b) Explain Electromyograph with its disadvantages. 7

7. a) Explain Cardiac monitor. **5**
b) Explain Blood pressure measurement system with its advantages. **8**

OR

8. a) Explain Bed side patient monitoring system. **7**
b) Explain how pulse rate can be measured ? Also give its advantages and disadvantages. **6**
9. Write short note on **any three**. **13**

- i) Ultrasonic Basic Pulse-echo apparatus.
ii) CT Scanning.
iii) X-ray machine.
iv) NMR.

OR

10. a) Explain how x-ray machine works with suitable diagram. **7**
b) What is the practical use of NMR ? Explain the system components of NMR. **6**
11. a) Explain preventive measures for electric shock in Biomedical equipments. **7**
b) Explain safety code for electrical equipments. **6**

OR

12. a) Explain various testing schemes for Biomedical equipments. **6**
b) Explain electrical safety analyzers. **7**
