



- Notes :
1. Same answer book must be used for each question.
 2. All questions carry marks as indicated.
 3. Due credit will be given to neatness and adequate dimensions.
 5. Assume suitable data wherever necessary.

1. a) Explain any two types of indirect blood pressure measurement technique. 7
- b) Draw & describe the working of cardiovascular circulation with equivalent engineering type of piping system. 9

OR

2. a) Explain in anatomy of heart & blood vessels. 8
- b) How to control the cardiac cycle explain. 8
3. a) Explain the general block diagram of medical instrumentation system. 8
- b) What are the general constraints in design of medical instrumentation system. 8

OR

4. a) Draw & explain basic medical instrumentation system. 8
- b) Explain intelligent medical instrumentation system. 8
5. a) Write the primary signal characteristics and type of electrode for following parameter. 7
 - i) ECG
 - ii) EEG
 - iii) EMG
- b) Explain the following sensor. 9
 - i) Electrochemical sensor.
 - ii) Fibro-sensor.
 - iii) Smart sensor.
6. a) Explain the measurement of Heart & pulse rate. 8
- b) How to measure the cardiac output & blood cell counter explain. 8
7. a) Describe method of recording electroencephalograph (EEG) & give significance of various EEG waves. 8

- b) Explain the general consideration for signal conditioners. 8

OR

8. a) Draw the circuit of typical differential amplifier configuration & explain. 8

- b) Write a short note on. 8
i) VCG Recorder.
ii) PCG Recorder.

9. a) Show on arrangement of components of a typical spectrophotometer type instruments & explain. 8

- b) Draw the block diagram of multi-channel colorimeter. 4

- c) Explain the pace maker. 4

OR

10. a) Draw the schismatic diagram of an automated continuous flow type analysis system. 8

- b) Write a short note on. 8
i) Defibrillator.
ii) Clinical flame photometer.
