**RAJALAKSHMI ENGINEERING COLLEGE**

**Thandalam, Chennai – 602 105**

**QUESTION BANK**

# **EI1351 BIO–MEDICAL INSTRUMENTATION**

**PART A**

**UNIT-I**

1. Explain the structure of Cell
2. Define DNA
3. What are resting and action potentials?
4. What is meant by central nervous system?
5. Define protoplasm
6. What are the electrolytes present in the cell?
7. What is the nature of cancer cell?
8. Define ICF and ECF
9. Define Goldman’s equation and Nernst equation of resting potential
10. Define sodium pump
11. Define arteries and veins
12. Define systolic and diastolic pressure
13. What are the different valves present in the heart?
14. Define heart beat
15. Define circulatory system
16. Define respiratory system
17. Define neuron, nerve fiber
18. Define synapse
19. Define CNS, PNS
20. Define cerebrum
21. What are the function of cerebellum?
22. Define transducer and its types
23. Mention some active transducer
24. List some passive transducer
25. Explain resistive transducer
26. Define loading effect and sensitivity of a transducer.
27. Define strain gauge
28. Define gauge factor
29. Define capacitive transducer
30. What is the principle of inductive transducer?

**UNIT – II**

1. What is a differential ampilfier?
2. Mention various bioelectrical potentials
3. Define electrodes and mention its types
4. Define all or nothing law.
5. What is electrode potential or half cell potential?
6. Define residual volume and tidal volume
7. Define polarized and non polarized electrodes
8. Name some piezo-electric materials
9. Define Seebeck effect, Peltier effect
10. Define LVDT
11. What is a pre amplifier?
12. Define CMRR
13. What are the function of chopper amplifier?
14. What are the basic components of bio-electric system?
15. What is the need of bio-amplifier ?
16. What is ECG?
17. Draw the Einthovan triangle
18. Draw ECG wave form
19. What are the types of ECG lead system?
20. What is EEG?
21. What are the applications of EEG?
22. What is EMG?
23. What is ERG?

**UNIT – III**

1. What is auscultation?
2. What are the types of BP measurement?
3. What is cardiac output?
4. What is cardiac rate?
5. What are the type of heart sound?
6. Write the equation to find PH value
7. Expand the term BSR and GSR
8. What is the use of plethysmograph?
9. What the method of blood flow measurement?
10. What are two methods of pulse measurement?

**UNIT - IV**

1. How are X rays produced.
2. What is the application of X rays?
3. What is the principle of CT?
4. Compare radiography and fluoroscopy
5. What is the application of CT?
6. What is ultrasonography?
7. Define NMR
8. Define endoscope and mention some of its types
9. Define thermograph
10. Define electrical safety
11. What are the types of thermography?
12. Draw the block diagram of biotelemetry
13. Define macro shock
14. Define micro shock

**UNIT - V**

1. What is pacemaker?
2. What are types of pacing modes?
3. What is demand pacemaker?
4. What is fibrillation?
5. What are types of fibrillation?
6. What are the various electrodes used for defibrillation?
7. What is counter shock?
8. What is the need for ventilators?
9. What is IIP?
10. What is stimulator?
11. What are the advantages of diathermy?
12. What is heart-lung machine?
13. What is dialysis?
14. What are the components of pacemaker?
15. What are type of pacemaker?
16. How are pulse generated in competitive pacemaker
17. Give the classification of pacemaker based on the modes of operation?
18. What are the advantages and disadvantages of standby pacemaker?
19. What is audiometer?
20. What are the types of audiometer?

**PART B**

**UNIT – I**

1. Draw the structure of a human cell and explain its constitutions.
2. What are action and resting potential . Explain Sodium pump.
3. Write a note on central nervous system
4. Explain the physiology of heart.
5. How does blood circulate throughout the body. Explain
6. Write a note on different types of transducers.
7. Explain the process of respiration.

**UNIT – II**

1. Discuss about different types of electrodes.
2. Explain the operation of isolation and chopper amplifiers.
3. What is the need for pre-amplifiers? Explain in detail.
4. Explain the basic components of a biomedical system.
5. Write a note on:
6. ECG
7. EMG
8. ERG
9. EEG

**UNIT – III**

1. Discuss in detail about Plethysomography.
2. What are the methods of measurement of blood pressure? Explain any two.
3. Write a short note on measurement of PH of blood.
4. Explain the methods of measurement of flow rate of CO2 and O2 in exhaust air.
5. How is heart sound measured. Explain.

**UNIT – IV**

1. Draw an X-ray tube and explain its construction and working
2. Describe various compents of X-ray machines
3. Distinguish between radiography and fluoroscopy
4. Explain the basic function of an audiometer with a suitable block diagram
5. What are micro shock and macro shock?
6. What are the different medical applications of thermograph?
7. Draw the block diagram of a CT and explain the different blocks of it
8. What are the different modes of ultrasonic scanning with suitable diagrams
9. Explain the importance of biotelemetry.
10. Explain the process of MRI.

**UNIT – V**

1. Why do we require heart-lung machines? Discuss its operation.
2. Discuss the different modes of operation of cardiac pacemaker.
3. Explain the types of diathermy.
4. Explain the process of peritoneal dialysis.
5. Explain the work of a defibrillator.
6. Write a note on audiometer.
7. Explain the use of ventilators.
8. Discuss in detail the working of a nerve and muscle stimulator.