

B.TECH DEGREE EXAMINATIONS: APRIL/MAY 2014

(Regulation 2009)

Seventh Semester

BIO TECHNOLOGY

EIE133: Biomedical Instrumentation

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The major hydraulic system of the body is
 - a) Respiratory system
 - b) Cardiovascular system
 - c) Nervous system
 - d) Auditory system
2. Ribosomes are composed mixtures of
 - a) RNA and proteins
 - b) RNA and lipids
 - c) RNA and glucose
 - d) RNA and electrolytes
3. The P wave is produced during
 - a) Atrial depolarisation
 - b) Atrial repolarisation
 - c) Ventricular depolarisation
 - d) Ventricular repolarisation
4. Lead II connection is
 - a) LA & RA
 - b) LL & RL
 - c) LL & LA
 - d) LL & RA
5. The various components of expired air can be determined by
 - a) Gas chromatography
 - b) liquid chromatography
 - c) Paper chromatography
 - d) Affinity chromatography
6. The diameter of red blood cells are
 - a) 10 μm
 - b) 4 μm
 - c) 8 μm
 - d) 12 μm
7. The penetrating ability of an X-ray beam is governed by
 - a) Kilovoltage or wavelength
 - b) Time
 - c) Mill ampere
 - d) Source-to-film distance
8. A and B scans are a part of
 - a) Thermal imaging
 - b) Ultrasonic imaging
 - c) MRI
 - d) X-Ray imaging
9. One very important device for performing auditory evoked response audiometry is a

- a) Wheatstone bridge.
 - b) inductorium.
 - c) averaging computer.
 - d) psychogalvanometer
10. During transport of ventilated patient, the rate of oxygen consumption depends on
- a) Cylinder pressure
 - b) Minute volume
 - c) The portable ventilator used
 - d) Bias flow.

PART B (10 x 2 = 20 Marks)

11. What is absolute refractory period?
12. How are pressure transducers used to acquire bio electric signals?
13. Define Eithoven triangle.
14. What is Korotkoff sound?
15. Measurement of pCO_2 is important. Why?
16. Write a short note on blood cell count.
17. What are fluoroscopes and how are they used in diagnoses?
18. Highlight the significance of biotelemetry.
19. Define Defibrillator.
20. What is dialysis?

PART C (5 x 14 = 70 Marks)

21. a) Give a detailed description of the human cardiovascular system with necessary sketches.

(OR)

- b) Explain about polarized cell with resting potential and depolarized cell during an action potential. Explain how action potentials are propagated through the cell.

22. a) Explain the lead configuration in ECG with neat sketches and also explain in detail the genesis of the ECG signal.

(OR)

- b) Explain the system of placement of electrodes while recording the brain activity of a human and with a neat block diagram explain the operation of an EEG equipment

23. a) With a neat sketch explain in detail about blood pH, blood pO_2 and ESR measurements

(OR)

b) Give a brief account of how spectrophotometry and chromatography can be used as medical instrumentation.

24. a) Show how computer tomography has revolutionized the field of diagnosis explaining its salient features.

(OR)

b) (i) Explain the principle of operation of MRI. (10)

(ii) List the types of commonly available endoscopes. (4)

25. a) List down the various types of pacemakers describing the working of any one of them.

(OR)

b) Describe in detail about a heart- lung machine.
