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 **Reg. No. :**

**Question Paper Code: 47053**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Seventh Semester

Instrumentation and Control Engineering

14UIC703 – BIOMEDICAL INSTRUMENTATION

(Common to Electronics and Instrumentation Engineering)

 (Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The positive potential of the cell membrane during excitation is

 (a) Action potential (b) Drift potential

 (c) Diffusion potential (d) Resting potential

2. The transducer that converts the input signal into the output signal, which is a discrete

 function of time, is known as \_\_\_\_\_\_\_\_\_\_ transducer.

 (a) Active (b) Analog (c) Digital (d) Pulse

3. EMG is an instrument used for measuring electrical activity of \_\_\_\_\_\_\_\_

 (a) Muscles (b) Brain (c) Skin (d) Heart

4. What is the cause for smeared trace of ECG machine?

 (a) Incorrect pressure on the paper (b) Incorrectly loaded paper

 (c) Incorrect placement of lead selector (d) Incorrect placement of pen tip

5. The capacitance microphone is used for the detection of \_\_\_\_\_\_\_\_\_\_\_

 (a) Heart rate (b) Blood flow (c) Heart sound (d) Foot pressure

6. Cardiac output is the amount of blood delivered by the heart to the aorta per\_\_\_\_\_

 (a) Minute (b) Second (c) Hour (d) Cycle

7. The commonest source of energy for pacemaker is the\_\_\_\_\_\_\_\_\_\_\_

 (a) Nuclear battery (b) Mercury battery (c) Dry cell (d) Solar cell

8. The instrument for administering the electric shock is called\_\_\_\_\_\_\_\_

 (a) Ventilators (b) Pace maker (c) Defibrillators (d) Stimulators

9. Among the following things which have the highest attenuation of ultrasound

 (a) Blood (b) Bone (c) Fat (d) Muscle

10. The maximum field strength used in MRI is.

 (a) 1.3 (b) 0.3 (c) 1.0 (d) 1.5

 PART - B (5 x 2 = 10 Marks)

11. What is meant by Resting Potential?

12. List the different types of ECG lead configuration?

13. Classify the heart sounds based on their mechanism of origin?

14. Mention the applications of ventricular inhibited pacemaker?

15. List the types of biometrics?

PART - C (5 x 16 = 80 Marks)

16.(a) (i) Explain the working principles of piezoelectric transducer. (8)

 (ii)Describe the generation and features of action potential and Resting Potential. (8)

 Or

 (b) Describe in detail about the basic components of a biomedical system? (16) .

17. (a) Describe in detail about the clinical significance, lead configuration, recording

 methods and waveforms of ECG. . (16)

Or

 (b) Explain the working of (i)EEG Recorder (ii)EMG System (16)

18. (a) Define Cardiac output. Discuss a technique to determine Cardiac output. (16)

 Or

 (b) Explain any one method of measuring blood pressure. (16)

19. (a) (i) What is defibrillator? Explain the operation of DC defibrillator. (8)

 (ii) Describe the construction and operation of Hemodialysis method. (8)

Or

 (b) (i) Explain the origin and working of heart-lung machine. (8)

 (ii) Explain the operation of monopolar diathermy. (8)

20.(a) Draw the block diagram of Computer tomography scanner and explain its

 operation with emphasis on image reconstruction. (16)

 Or

 (b) Explain in detail about the basic principle of Thermography. With neat diagram

 explain the different parts of the Thermal Imaging system. (16)