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Question Paper Code : 50512

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017
Seventh Semester
Electrical and Electronics Engineering
EI6704 : BIOMEDICAL INSTRUMENTATION
(Common to Electronics and Instrumentation Engineering/Instrumentation and Control Engineering)
(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. Define the terms (i) action potential and (ii) resting potential.
2. List four criteria for the selection of transducers for bio potential measurement.
3. Which arm is normally used for blood pressure measurement ? List three variables that affect blood pressure measurement.
4. When can one hear Korotkoff sounds ?
5. Mention the frequency range of alpha, beta, theta and delta brain waves.
6. List four possible sources of noise in ECG signal measurement.
7. Mention the different modes of ultrasound imaging.
8. Mention the different types of coupling mechanisms in isolation amplifier.
9. A defibrillator contains a capacitor charged to a voltage of 6000 V with an energy store of 200 J. Calculate the capacitance of the capacitor.
10. What is a demand pacemaker ?

PART – B (5×16=80 Marks)

11. a) With a neat diagram, explain the function of cardiovascular system.

(OR)

b) Explain in detail the principle and working of piezo electric transducer for biomedical application.

12. a) With a neat diagram explain the components of plethysmograph. Also mention different types of plethysmograph.

(OR)

b) Explain in detail about the direct (strain gauge) method and indirect method (sphygmomanometer) of blood pressure measurement.

13. a) With a neat sketch explain the construction and the principle of operation of (i) Microelectrode and (ii) Skin surface electrode.

(OR)

b) Explain 10-20 system of electrode placement for the measurement of EEG signal. How is it different from 10-10 system of electrode placement ?

14. a) With a neat illustration, explain the principle of Magnetic Resonance Imaging. How is it different from X-ray and CT-imaging system ?

(OR)

b) With a suitable diagram, explain various components of retinal imaging. Also explain the advantages of Optical Coherence Tomography (OCT) when compared to fundus imaging.

15. a) What is the need for a pacemaker ? With a neat functional diagram, explain the various components of pacemaker.

(OR)

b) With suitable diagram describe the hemodialysis and peritoneal dialysis.