Total No. of printed pages = 3

CAI-601/BI/6th Sem/R/2013/M

BIOMEDICAL INSTRUMENTATION

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer any *five* questions.

1. Explain the physiology of respiratory system with diagram. Describe the behaviour of cell under different circumstances and the phenomena of depolarization, polarization and repolarization. 5+9=14

2. Discuss electroretinography and electrooculography with their characteristics.

   For the measurement of EEG readings which type of electrode is mostly used ?

   Describe a method to measure skin contact impedance. 6+1+7=14

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3. (a) What are the techniques available for the measurement of heart rate ?

(b) Draw the block diagram of instantaneous heart rate meter and briefly describe the function of each block.

(c) Describe the technique for processing plethysmographic signal. 2+6+6=14

4. (a) What is respiration rate ? How thermistor is used to measure respiration rate ?

(b) Describe the operation of strain gauze and list as many biomedical application as you can. 2+5+7=14

5. (a) Explain the working of chopper amplifier.

(b) What is the main advantage of using differential amplifier in biomedical equipment ?

(c) Neatly draw the unipolar chest lead configuration with their waveform pattern. Explain how LVDT can be used in biomedical instrumentation. 6+1+3+4=14

6. (a) What is the function of collimator and grids in X-ray imaging ?

(b) What are the advantages of rotary anode tube over stationary anode tube ?

(c) Describe the working principle of dental image intensifier system. 4+2+8=14

7. (a) What is microshock and macroshock ?

(b) Explain in details how chassis leakage current is measured for the testing of biomedical equipments.

(c) Describe about let go current and ventricular fibrillation. 2+8+4=14