B.TECH SEM – V (2007 COURSE) (BIOMEDICAL ENGG.) :
WINTER - 2017
SUBJECT : BIOMEDICAL ELECTRONICS - I

Day : **Saturday**
Date : **13/01/2018**

W-2017-2485

Time : **02.30 PM TO 05.30 PM**
Max. Marks : 80

N.B.:

1) **Q.No.1** and **Q.No.5** are **COMPULSORY**. Out of the remaining attempt **ANY TWO** questions from each section.
2) Answer to the both the sections should be written in **SEPARATE** answer books.
3) Draw neat and labeled diagrams **WHEREVER** necessary.
4) Figures to the right indicate **FULL** marks.
5) Assume suitable data if necessary.

SECTION – I

Q.1 **a)** State and explain: **[05]**
i) Fick's law **ii)** Particle drift
b) What is the importance of Chopper amplifier in biomedical instruments? **[05]**
c) Explain Wilson network used for ECG chest leads. **[04]**

Q.2 **a)** What is EGG? Explain electrogasteogram with the waveforms and write the amplitude and frequency range. **[06]**
b) Explain the successive stages of an action potential with neat diagram. **[07]**

Q.3 **a)** What is heart sound and heart murmur? Write frequency of each and explain with neat diagram. **[07]**
b) Explain the safety and danger zones for human body when the human body comes in contact with electrical circuits. **[06]**

Q.4 **a)** How the averaging is done while recovering and analyzing the biosignal? Give one example with any random signal. **[06]**
b) What is medical preamplifier? How the gain and CMRR is adjusted with the help of medical preamplifier? **[07]**

SECTION – II

Q.5 **a)** What are the REM and NREM? Write the duration for REM and NREM. **[04]**
b) Explain the working principle of NMR blood flow meter with diagram. **[06]**
c) Write the applications of laser in biomedical. **[04]**

Q.6 **a)** Explain 10 – 20 lead system used to monitor brain waves. **[07]**
b) List ECG and EMG electrodes. Explain any one electrode used to record ECG and EMG signal respectively. **[06]**

Q.7 **a)** Explain the basic spirometry principle used to record lung function. **[07]**
b) Explain the electromagnetic blood flow meter with neat diagram. **[06]**

Q.8 **a)** Explain the following with waveforms: **[07]**
i) Faradic current **ii)** Surged faradic current.
b) What are the advantages of microwave over shortwave diathermy? **[06]**

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