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B.E. (Electronics)

BIOMEDICAL ELECTRONICS

(2003 Course)

Time : 3 Hours] *[Max. Marks :100*

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate books.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

SECTION - I

Q1) a) Explain the process of polarization, depolarization and repolarization with neat diagram. **[9]**

b) What do you mean by absolute refractory period and relative refractory period? Compare with resting potential and action potential. **[9]**

OR

Q2) a) What is bioelectric potential? Explain in detail with necessary diagram. **[9]**

b) With the help of two electrode equivalent circuit. Explain measurement of biopotential and a half cell potential. **[9]**

Q3) a) Write the equation to calculate the following. **[8]**

i) aVF
ii) aVR
iii) aVL
iv) lead II.

b) Draw the ECG waveform. Lable the critical parts of the waveform show amplitude and time duration for normal ECG. **[8]**

OR

Q4) a) Draw bipolar limb leads unipolar argumented limb leads and explain with necessary diagram. **[8]**

b) How an isolation amplifier is used in a biosignal amplification? Explain detail, working of such amplifier. **[8]**

P.T.O.

Q5) a) Explain the concept of vectorcardiography with necessary diagram. **[8]**

b) What do you mean by patient monitoring system? Explain the bed side monitoring system with the help of neat block diagram. **[8]**

OR

Q6) a) Explain any two types of cardiac pacemakers in detail with necessary waveforms. **[8]**

b) Differentiate between DC and AC defibrillators. Explain the necessity in controlling the fibrillation. **[8]**

SECTION - II

Q7) a) Explain the flame photometer with necessary diagram. **[9]**

b) Describe the working of colorimeter with the help of neat diagram. **[9]**

OR

Q8) a) Draw the circuit diagram and explain their operation for computation of
i) base excess.
ii) total CO_2.
iii) bicarbonate **[9]**

b) Name the different method of cell counting. Explain any one in detail. **[9]**

Q9) a) What are the different types of EMG. Explain the procedure to perform EMG. **[8]**

b) Define the α, β, θ, δ and ϑ activities. **[8]**

OR

*Q10)*a) What are the different components of central nervous system? Explain in detail. **[8]**

b) Draw the schematic diagram of an EEG machine. Explain the different blocks in detail. **[8]**

*Q11)*a) Explain the basic steps required to form laser beam. **[8]**

b) Give the comparison between Ruby laser and He-Ne laser. **[8]**

OR

*Q12)*a) Explain the operation of X-Ray Machine with the help of neat block diagram. **[8]**

b) Explain the principles of MRI. How does an MRI scanner works. **[8]**