Total No. of Questions : 12]

SEAT No. :

P1407

[Total No. of Pages : 3

[4759]-115

B.E. (Electronics)

BIOMEDICAL INSTRUMENTATION

(2008 Course) (Semester - I) (Elective -I) (Theory)

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

Instructions to the candidates:

1) ***Answer three questions from each section.***
2) ***Answers to the two sections must be written in separate answer-books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***Assume suitable data, if necessary.***
6) ***Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.***

SECTION - I

Q1) a) Explain with block diagram medical instrumentation system. **[8]**

b) Explain with suitable diagram action potential, resting potential, depolarization and repolarization of a cell. **[8]**

OR

Q2) a) What are the drawback of surface electrode? Explain different electrodes used for ECG. **[8]**

b) State and explain sensor performance characteristics. **[8]**

Q3) a) Draw a block diagram of EEG machine and explain each blocks in detail. **[8]**

b) Draw and explain 10-20 electrode system for EEG recording. **[8]**

OR

P.T.O.

Q4) a) What are the applications of EEG? Explain any 3 EEG waveforms with their frequency and significance. **[8]**

b) Write a brief note on EMG. **[8]**

Q5) a) Lead I amplitude is 1.2 mV Lead III amplitude is 0.55mV with calibration of 1mV=5mm. Find Lead II, aVR, aVL, aVF values. **[8]**

b) Explain an electroconduction system of the heart. **[6]**

c) Write a short note on heart sounds. **[4]**

OR

Q6) a) What are the effect of artifacts on ECG recording? Draw and explain a block diagram of ECG machine. **[8]**

b) Describe ECG wave form and give specification of ECG amplifier. **[6]**

c) Write the equation to calculate Lead II, aVR, aVL & aVF. **[4]**

SECTION - II

Q7) a) With the help of suitable diagram describe oscillometric method of BP measurement technique. Elaborate its merits and demerits. **[8]**

b) Explain in detail R-wave triggered and P-wave triggered mode of pacemaker. **[8]**

OR

Q8) a) Explain in details Doppler shift flow velocity meter. **[8]**

b) Explain the working of DC defibrillator with circuit diagram and waveform. **[8]**

Q9) a) What are the different elements included in the blood cell test? Explain the coulter counters method of cell counting. **[8]**

b) What is pulse oximeter? Explain how an oximeter works. **[8]**

OR

Q10)a) What is pH of blood? Explain electrode used in blood pH measurement. **[8]**

b) What are the advantages & disadvantages of electronic stethoscope? **[8]**

Q11)a) What are the advantages of CT scan over conventional X-ray imaging? Explain the principle of working of CT scan machine. **[9]**

b) What are the advantages of laser over other light source? Explain 3 processes to form laser beam. **[9]**

OR

Q12) Write a short note on (any 3): **[18]**

a) Applications of Laser in medicine.

b) MRI Vs CT scan.

c) Ultrasound machine.

d) Shadow less light.

e) Orthopentamo graph.

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