15308

B. Tech 7th Semester Examination

Bio-Medical Engineering (NS)

EE-413

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

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt Five questions. Select one question from each of the section A, B, C and D. Question no. 9 in Section E is compulsory.

SECTION - A

1. What is the role of Sodium and Potassium in cell potentials? How the ions cross the cell membrane? (20)

2. Explain the working of Ag-AgCl electrode. How it is applied in obtaining EEG? (20)

SECTION - B

3. Design a schematic for measurement of breath rate using temperature transducers. (20)

4. Explain the merits of potentiometric recorders over others. (20)

SECTION - C

5. Which biosignal would provide the Saccadic movement of the Eyes? What can be the application of that biosignal? (20)

6. Explain Electromyography? What is the frequency range of the EMG signal? What are the usages of EMG analysis? (20)

SECTION - D

7. What is the method of making transparent organs of interest opaque for the purpose of X-Ray/CT? How Kidneys are made opaque in CT? (20)

8. Explain the functioning of a dental X-Ray system. What precautions are required in Dental X-Rays? (20)

SECTION - E

9. (i) What is the frequency range of the ECG signal?

   (ii) Mention the frequency and occurrence of the four heart sounds.

   (iii) In a strip chart recording, what are the units on horizontal and vertical scales?

   (iv) If a patient is having spikes with high amplitude in EEG, what may be the likely disease?

   (v) Explain the working of a stethoscope.

   (vi) What are the differences in analog and digital recorder?

   (vii) How the cardiac axis is measured in VCG?

   (viii) What is biofeedback?

   (ix) What are the therapeutic uses of ultrasound?

   (x) Which signals are non-stationary and in frequency domain? (10×2=20)