[Total No. of Questions - 9] [Total No. of Printed Pages - 3] (2125)

15312

B. Tech 7th Semester Examination

Biomedical Electronics (NS)

EC-411(b)

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 in all, selecting one question each from section A, B, C & D. Section-E is compulsory.

SECTION - A

1. (a) Draw block diagram of a typical biomedical measurement system and describe various components in detail. (10)

   (b) What are the typical characteristics of sensors used in a biomedical instrument? Describe all characteristics in detail. (10)

2. (a) Discuss typical characteristics of sensors used in biomedical instruments. Describe resistive and capacitive sensors used in biomedical instrumentation. (10)

   (b) Describe how biomedical instrument is different from ordinary instrument? (10)

SECTION - B

3. (a) What do you understand by bioelectric potentials? What is their origin? Describe resting and action potential in detail. (10)

   (b) Draw the typical ECG waveform discussing the origin and importance of various parameters of ECG waveform. (10)

4. (a) Describe the unipolar and bipolar lead placement of ECG electrodes. (10)

   (b) Draw the block diagram of ECG machine and describe each component in details. (10)

SECTION - C

5. (a) Describe the respiratory measurement system in detail. (10)

   (b) Describe auscultatory measurement principle based electronic blood pressure measurement system. (10)

6. (a) Describe ultrasonic flowmeter in details. (10)

   (b) Describe the electronic instrumentation used for blood glucose measurement. (10)

SECTION - D

7. (a) Draw the block diagram of CT scan machine and describe various components. (10)

   (b) What do you understand by defibrillators? Why these are used? (10)

8. (a) Explain the working of MRI machine. (10)

   (b) What are electronic shock hazards? How it can be prevented in biomedical instruments? (10)

SECTION - E

9. (a) Explain strain gauge.

(b) What are different valves present in the heart?

(c) What are the different types of ECG lead system?

(d) What are different types of heart sounds?

(e) What is dialysis?

(f) What is sodium pump?

(g) What is micro shock?

(h) What is EMG?

(i) Discuss bandwidth requirements of BP measurement.

(j) Enlist different EEG waves. What are their characteristics?

(2×10=20)