

Total No. of Questions : 6]

SEAT No. :

P45

[Total No. of Pages : 2

APR - 17/BE/Insem - 52

B.E. (E&Tc)

BIOMEDICAL SIGNAL PROCESSING (Elective -IV (a))

(2012 Pattern)

Time : 1 Hour]

[Maximum Marks : 30

Instructions to the candidates:

- 1) *Answer any three questions.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Use of calculator is allowed.*
- 5) *Assume suitable data if necessary.*

- Q1)** a) Explain different type of electrodes for measurement of Bio signal. [6]
b) What are some of the problems associated with high skin impedance?[4]

OR

- Q2)** a) Draw & explain block of Biomedical instrumentation system. [6]
b) Define Bio electric signal & give full expanded form of following. [4]
i) EMG
ii) EEG
iii) EOG
iv) ERG

- Q3)** a) Explain the Cardio vascular system with neat sketch. [6]
b) Explain following term in brief. [4]
i) Reflex action
ii) Receptors

OR

- Q4)** a) What do you mean by Blood pressure measurement? Explain any one method in detail. [6]
b) Draw ECG wave form & give normal value of amplitude and duration of important ECG parameter. [4]

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- Q5)** a) Draw a schematic representation of Einthoven's triangle showing the directions of leads I, II, and III of the ECG signal. Explain unipolar and bipolar lead configuration in ECG. [6]
- b) Write down about artifacts during ECG signal processing. [4]

OR

- Q6)** a) What are the objectives of biomedical signal analysis? What difficulties face during biomedical signal analysis? [6]
- b) Explain why the P and T waves are low-frequency signals whereas the **QRS** complex is a high-frequency signal. [4]

