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Total number of printed pages – 2

B. Tech  
PEEC 5416

**Seventh Semester Back Examination – 2014**

**BIOMEDICAL INSTRUMENTATION**

**BRANCH(S) : BIOTECH, CSE, IT**

**QUESTION CODE : L 192**

**Full Marks – 70**

**Time : 3 Hours**

*Answer Question No. 1 which is compulsory and any **five** from the rest.*

*The figures in the right-hand margin indicate marks.*



1. Answer the following questions : 2×10
- (a) Write the sources of bio-acoustic signal.
  - (b) What are the advantages of using Intelligent medical instrumentation system ?
  - (c) Explain the phenomena of muscular contraction.
  - (d) Write the origin of bio-electric signal.
  - (e) What is a transducer ?
  - (f) What is a Smart Sensor ?
  - (g) Write the purpose of using Recording system in biomedical instrumentation system.
  - (h) Write the ranges of blood pressure in various parts of blood circulation system.
  - (i) What is Doppler effect ?
  - (j) What is Let-go-current ?
2. (a) Describe the following terms : 5
- (i) Diagnosis
  - (ii) Monitoring
  - (iii) Therapy

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- (b) Briefly explain various constraints in design of a medical instrumentation system. 5
3. (a) Explain the phenomena of Repolarization of cell, Depolarization of cell and Muscular Contraction. 5
- (b) List various electrodes used for 5
- (i) ECG
- (ii) EEG
- (iii) EMG
4. (a) List various instruments used for biomedical pressure and temperature measurement. 5
- (b) Briefly explain construction and principle of operation of any ONE type of Biosensor. 5
5. (a) Briefly explain various biomedical signal analysis and processing techniques. 5
- (b) Describe construction and principle of operation of any ONE type of biomedical recording system. 5
6. (a) Briefly explain principle of measurement of heart rate. 5
- (b) Briefly explain principle of measurement of respiration rate. 5
7. (a) Briefly explain construction and principle of operation of electromagnetic blood flow meter. 5
- (b) Describe various electric shock hazards which may be encountered in biomedical instrumentation system. 5
8. Answer any **two** of the following : 5×2
- (a) Effect of motion artifact on biomedical instrumentation.
- (b) Construction and principle of operation of Phonocardiograph.
- (c) Construction and principle of operation of Ultrasonic blood flow meter.

