

Registration No. :

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Total number of printed pages – 2

B. Tech  
PEEC 5416

Seventh Semester (Special) Examination – 2013

BIOMEDICAL INSTRUMENTATION

BRANCH : AEIE, EC, ETC, IEE

QUESTION CODE : D 413

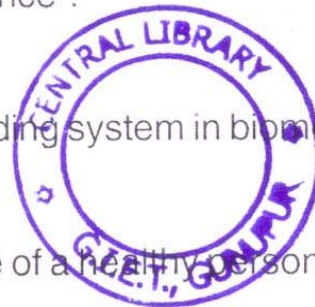
Full Marks – 70

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) List various sources of biomedical signals.
  - (b) What are the advantages of PC based medical instrumentation system ?
  - (c) Why electrodes are used in biomedical instrumentation ?
  - (d) What is Skin Contact Impedance ?
  - (e) What is a Transducer ?
  - (f) What is the function of Recording system in biomedical instrumentation ?
  - (g) What is electromyography ?
  - (h) Write the range of Heart Rate of a healthy person.
  - (i) What is meant by Patient Monitoring ?
  - (j) What is meant by Leakage Current ?
2.
  - (a) Briefly describe basic medical instrumentation system. 5
  - (b) What are the constraints in design of medical instrumentation system ?  
Describe. 5
3.
  - (a) Describe the origin of bioelectric signal and explain how action potential develops. 5



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- (b) What is Motion Artifact ? Is it a desirable phenomenon ? If, YES, justify. If NO, explain how to minimize the effect of Motion Artifact ? 5
- 4 (a) Briefly describe the classification of transducers. 5
- (b) Describe construction and operation of any ONE Pressure transducer. 5
- 5 (a) Briefly describe signal processing techniques used in medical instrumentation. 5
- (b) Draw functional block diagram of a Electrocardiograph explain it's operation. 5
- 6 (a) Describe in brief measurement of Respiration Rate. 5
- (b) Write only the basic principles of operation of
- (i) Electromagnetic Blood flow meter and
- (ii) NMR blood flow meter. 5
- 7 (a) Briefly describe the construction and operation of Ultrasonic blood flow meter. 5
- (b) Briefly explain various Electric Shock Hazards 5
8. Write short notes on any **two** of the following 5×2
- (a) Electrode for ECG – Construction and characteristics
- (b) Phonocardiograph – Construction and operation
- (c) Measurement of Heart Rate

