

Registration No. :

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Total number of printed pages – 2

B. Tech  
PEEC 5416

**Seventh Semester Back Examination – 2014**

**BIOMEDICAL INSTRUMENTATION**

**BRANCH (S) : AEIE, EC, ETC, IEE**

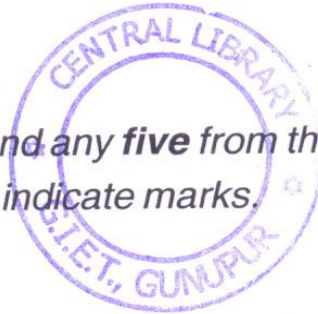
**QUESTION CODE : L 162**

**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 bioelectric signal.
- (b) List various parameters measured for biomedical diagnosis.
- (c) Why electrodes are used for biomedical instrumentation system ?
- (d) What is meant by Skin Contact Impedance ?
- (e) Distinguish between transducer and sensor.
- (f) What are the advantages of using Smart Sensors ?
- (g) What is electroencephalograph ?
- (h) Write normal ranges of Heart rate and Blood Pressure of a healthy person.
- (i) Explain Doppler effect within few sentences.
- (j) Distinguish between Micro Shock and Macro Shock.

2. (a) Describe various components used in medical instrumentation system. 5  
(b) Describe general constraints in design of a medical instrumentation system. 5

3. (a) Draw an action potential waveform generated by a cell. Explain the phenomena of Repolarization and Depolarization. 5  
(b) Describe the effect of motion artifacts on biomedical instrumentation. 5

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4. (a) Briefly describe construction and principle of operation of various pressure transducers used in biomedical instrumentation. 5
- (b) Describe general considerations for signal conditioners used in biomedical instrumentation. 5
5. (a) With suitable example distinguish between signal conditioning and signal processing. 5
- (b) With suitable block diagram explain the basic functions of electrocardiograph. 5
6. (a) Briefly explain principle of measurement of heart rate. 5
- (b) Briefly explain principle of measurement of respiration rate. 5
7. (a) Describe construction and principle of operation of electromagnetic blood flow meter. 5
- (b) Describe construction and principle of operation of NMR blood flow meter. 5
8. Answer any **two** of the following : 5×2
- (a) List various electrodes used for ECG, EEG and EMG.
- (b) What are the advantages of using Smart Sensors ?
- (c) What is electroencephalograph ?

