

Total No. of Questions : 12]

SEAT No. :

**P767**

**[4659] - 113**

[Total No. of Pages : 2

**B.E.(Electronics)**

**BIO-MEDICAL INSTRUMENTATION (TH)**

**(2008 Pattern) (Elective - I(c)) (Semester- I)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates:*

- 1) Answer any three questions from each section.*
- 2) Answer to the two sections should be written in separate books.*
- 3) Neat diagrams must be drawn wherever necessary.*
- 4) Figures to the right indicate full marks.*
- 5) Assume suitable data, if necessary.*

**SECTION - I**

- Q1)** a) Explain the various types of body signal. [6]  
b) Draw and explain electrical equivalent circuit of the body cell structure. [6]  
c) Explain in detail the electrode skin interface and motion artifact. [6]

**OR**

- Q2)** a) Write a short note on Bio-Medical instrumentation system. [6]  
b) Explain the construction and working principle of chemical sensor for measurement of pH. [6]  
c) Write a note on Bio-Electrodes. [6]
- Q3)** a) Explain 10-20 electrode placements for EEG. [8]  
b) Write a note on analysis of diseases using EEG. [8]

**OR**

- Q4)** a) Explain the types and significance of EEG signals. [8]  
b) Write a note on EMG machine. [8]
- Q5)** a) Draw and explain the Einthoven's Triangle showing clearly the standard wave patterns recorded. [8]  
b) Write a note on Phonocardiography. [8]

**P.T.O.**

**OR**

- Q6)** a) Explain the correlation of the four heart sounds with electric and mechanical events of the cardiac cycle. Also give different Auscultation techniques. [8]
- b) Explain in detail ECG Machine. [8]

**SECTION - II**

- Q7)** a) Write in brief about the life saving instrument - Defibrillator. [6]
- b) Explain finger plethysmography. [6]
- c) Give any two techniques for the blood flow measurement. [6]

**OR**

- Q8)** a) Explain briefly the types of pacemakers. [6]
- b) Explain the sphygmomanometer. [6]
- c) Write a note on Bedside monitor. [6]

- Q9)** a) Explain the concept of blood gas analyzer. [8]
- b) Explain the significance and working principle of an electron microscope. [8]

**OR**

- Q10)**a) Explain pulse oximeter with neat diagram. [8]
- b) Explain in brief dialysis system. [8]

- Q11)**a) Explain the MRI machine. [8]
- b) How lasers are used in dermatological applications. [8]

**OR**

- Q12)**a) Write a note on Ultrasonic Doppler Machine. [8]
- b) Explain the Ortho Pentamo graph. [8]

