

Total No. of Questions : 8]

SEAT No. :

P2008

[Total No. of Pages : 2

[5059] - 606

**B.E. (Electronics) (End Semester)**  
**BIOMEDICAL INSTRUMENTATION**  
**(2012 Pattern) (Elective - I)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.*
- 2) Neat diagrams must be drawn wherever necessary.*
- 3) Figures to the right side indicate full marks.*
- 4) Use of Calculator is allowed.*
- 5) Assume suitable data, if necessary.*

- Q1)** a) List out different Bio-medical physical sensor with their Bio-medical application and explain sensor performance characteristics. [8]
- b) Explain the block diagram of typical ECG machine. [6]
- c) Explain in detail different types of continuous rhythmic sinusoidal EEG activity. [6]

**OR**

- Q2)** a) Write short note on ECG amplifier with input protection & isolation circuit. [8]
- b) Explain in detail about Bio-potential electrode. [6]
- c) Explain 10-20 electrode placement system for EEG. [6]

- Q3)** a) What are the objectives of patient monitoring system? With block diagram explain bed side monitoring system. [8]
- b) What is systolic and diastolic pressure? Explain non-invasive blood pressure measurement technique. [8]

**OR**

**P.T.O.**

- Q4)** a) Explain electromagnetic blood flow meter with its salient features. [8]  
b) Write short note on stress test system. [8]

- Q5)** a) Discuss various issue of noise pollution around hospital. [8]  
b) Explain blood gas analyzer for measurement of PH, PO<sub>2</sub> & PCO<sub>2</sub>. [8]

**OR**

- Q6)** a) Explain patient safety consideration in equipment design. [8]  
b) Write short note on colorimeter. [8]

- Q7)** a) What is basic principle of MRI? Explain merits & demerits of MRI system. [10]  
b) Explain application of Telemetry in patient caring. [8]

**OR**

- Q8)** a) Gives advantages & disadvantages of LASER in medicine. Explain general LASER safety guideline. [10]  
b) Describe different technique for ultrasonic imaging. [8]

