



Reg. No. : .....

Name : .....

**Eighth Semester B.Tech. Degree Examination, January 2018**  
**(2013 Scheme)**  
**13.806.2 : BIOMEDICAL ENGINEERING (T)**  
**(Elective VI)**

Time : 3 Hours

Max. Marks : 100

**PART – A**

Answer **all** questions :

**(10×2=20 Marks)**

1. Explain resting potential and action potential.
2. Explain rhythmic excitation of heart.
3. Explain Plethysmography.
4. What is phonocardiography ?
5. Write various applications of MRI.
6. Explain ultrasound transducer in brief.
7. Explain principles of image formation in ultrasound.
8. What are the physiological parameters adaptable to biotelemetry ?
9. What is an implantable unit ? Explain it.
10. Write various applications of telemetry in patient care.

**PART – B**

Answer **any one full** question from **each** Module. **Each full** question carries **20** marks.

**MODULE – 1**

11. a) What do you mean by biopotential electrodes ? How these electrodes are classified ? How biopotential can be measured by using two electrodes ? **6**
- b) What are different transducers which are used for biomedical applications ? Prepare a table with columns the physical variable and type of transducer. Name the transducers used for blood pressure measurement and blood flow measurement. **14**

OR

P.T.O.



12. a) What is bioelectric potential ? Explain how it can be generated. 5  
 b) Explain the generation and acquisition of ECG and EMG signals. 15

### MODULE – 2

13. a) Explain cardiovascular system and cardiovascular measurement with suitable diagram. 10  
 b) Explain invasive and non-invasive blood pressure measurements with neat diagrams. 10

OR

14. a) Explain heart rate and heart sound measurement with neat diagrams. 10  
 b) Explain measurement of blood flow and cardiac output with neat diagrams. 10

### MODULE – 3

15. a) In both X-ray and radioisotope procedures, potentially, harmful ionizing radiation is used for diagnostic purposes. Why is the safe intensity of radiation of X-rays much higher than that for isotopes methods ? Describe X-ray production arrangement. 10  
 b) Explain A-mode, B-mode and M-mode display in Ultrasound. 10

OR

16. a) Explain working principle of MRI with neat diagram. 10  
 b) Explain image reconstruction techniques in CT scanner with neat diagram. 10

### MODULE – 4

17. a) What do you mean by fibrillation ? Draw the circuit arrangement of a D.C. defibrillator and explain its working. 15  
 b) Write short notes on Ventilator. 5

OR

18. a) Write short notes on the followings : 12  
 i) Heart lung machine      ii) Hemodialysis.  
 b) Explain a basic bio-telemetry system with block diagram along with its advantages and disadvantages. 8