

B.E. Instrumentation Engineering (Model Curriculum) Semester-VIII  
**IN803M - Open Elective-II - Biomedical Engineering**

P. Pages : 2



Time : Three Hours

**GUG/S/25/14365**

Max. Marks : 80

- Notes :
1. Same answer book must be used for each section.
  2. All questions carry marks as indicated.
  3. Due credit will be given to neatness and adequate dimensions.
  4. Illustrate your answers wherever necessary with the help of neat sketches.

- 1.** a) Explain Patient Monitoring System? State short term and long term objectives of Patient Monitoring System? 8
- b) State different types of Invasive methods of Blood Pressure measurement. Explain any one type in detail. 8

**OR**

- 2.** a) Explain Ultrasonic Doppler shift method of automatic BP monitoring system. Draw block diagram representing major sub-systems used in Ultrasonic BP monitor. 8
- b) Discuss Indirect methods of Blood Pressure measurement. Draw and explain the diagram for principle of BPM based on Korotkoff sound. 8
- 3.** a) Explain basic types of measurements made in Pulmonary Function Analysis. 8
- b) What is Spirometry? Discuss Basic Spirometer in detail with suitable diagram. 8

**OR**

- 4.** a) Illustrate with suitable diagram the mechanics of respiration and artificial ventilation process in detail. 8
- b) Draw and explain schematic diagram of Anaesthesia machine and patient breathing circuit. 8
- 5.** a) Explain Shortwave Diathermy with simplified block diagram & state its application techniques. 8
- b) Elaborate the term TENS with respect to pain relief through electrical stimulation. 8

**OR**

- 6.** a) Explain in detail the Microwave Diathermy with simplified block diagram. 8
- b) Write short note on the following. 8
- |                          |                           |
|--------------------------|---------------------------|
| a) Electrotherapy        | b) PSWT                   |
| c) Deep brain stimulator | d) Spinal cord stimulator |

7. a) Draw a overview diagram of Digestive system. Mention different organs involved in it. State their key functions and roles. 8

- b) Define Deglutition. Explain different phases involved in it. 8

**OR**

8. a) Discuss the process for formation of urine in human body. Draw a neat sketch of Nephron. 8

- b) Draw a neat sketch of small and large intestine. Explain different process supporting digestion with hormones related to Alimentary canal. 8

9. a) Explain in detail the He-Ne laser with simplified diagram. 8

- b) State applications of laser in biomedical field. Describe its classification. 8

**OR**

10. a) Discuss briefly the principle operation of Laser and safety precautions to be taken care off during its operation. 8

- b) Illustrate Argon-laser with simplified diagram. 8

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