Printed Pages:02 **Sub Code: EBM 031**

Paper Id: | 1 | 0 | 1 | 6 | 3 | 1 | **Roll No.** | | | | | | | | | | |

B.Tech
(SEM VIII) THEORY EXAMINATION 2017-18
ADVANCED BIOMEDICAL INSTRUMENTATION

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

a) Describe the Beer-Lambert's Law in spectrometry.
b) Define automated biochemical analysis systems.
c) Explain how autoclave is used for sterilization?
d) Explain where NMR blood flow meter is used?
e) Explain oximetry and define oxygen saturation.
f) Explain Respiratory volumes used in measurement of pulmonary functions.
g) Explain spirometry.
h) What is a phonocardiograph (PCG)
i) Define Endoscopy.
j) What are Cystoscopes & Laparoscopes?

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a) Sate the different methods for blood cell counting. Explain the principle of Coulter Counters
b) Explain the impedance technique for the measurement of cardiac output.
c) What do you mean by pneumotachography? Describe the different types of pneumotachometers used to measure parameters pertaining to pulmonary functions.
d) Discuss the various types of endoscopes. State their use in various applications.
e) Explain how the measurement of blood pressure is executed using a sphygmomanometer instrument which is based on the Korotkoff sound.

SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10

(a) What is a Colorimeter? Explain the principle of its measurement and its applications

(b) Explain the working of a clinical flame photometer. With the help of a block diagram explain the essential parts of a clinical flame photometer.

4. Attempt any *one* part of the following: 10 x 1 = 10

(a) Explain the principle of operation for a electromagnetic blood flow meter.

(b) Explain the principle of operation for an ultrasonic Doppler-shift flow velocity meter with the help of a block diagram

5. Attempt any *one* part of the following: 10 x 1 = 10

(a) How blood pCO2 is defined? Explain the construction of pCO2 Electrode for the measurement of blood pCO2.

(b) What are pulmonary function analyzers? Describe the block diagram of a pulmonary function analyzer.

6. Attempt any *one* part of the following: 10 x 1 = 10

(a) Describe the direct method for the measurement of blood pressure with the help of a diagram.

(b) Discuss the various types of indirect methods for the measurement of blood pressure. Explain the automated indirect measurement of blood pressure measurement.

7. Attempt any *one* part of the following: 10 x 1 = 10

(a) Explain in-vitro oximetry and in-vivo oximetry and differentiate between the two methods of oxygen saturation measurement.

(b) Explain the characteristics and differences between fiber optic endoscopes and endoscopes with integral TV cameras