Printed Pages : 3

EBM031

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 101857

Roll No.

B. Tech.

(SEM. VIII) THEORY EXAMINATION, 2014-15

ADVANCED BIOMEDICAL INSTRUMENTATION

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

Note : Attempt all questions :

1 Attempt any four parts of following : **4×5=20**

(a) Draw the block diagram of an automatic blood cell counter.

(b) Give an account on scanning electron microscope.

(c) What are photometers ? Explain them briefly.

(d) Describe a flame photometer with a suitable diagram.

(e) Give the basic principle of fluorometry.

(f) Explain the principle of chromatography and its applications in medicine.

2 Attempt any four parts of following : **4×5=20**

(a) Write a note on scintillation counters.

(b) What are oximeters ? Describe any one of the Oximeters with a suitable diagram.

(c) Draw a circuit diagram of a pH meter and explain its working detail.

(d) Briefly mention the uses of gas analyzers.

(e) Compare the different methods used in the cardiac output measurements.

(f) Describe a spirometer with a suitable schematic diagram.

3 Attempt any four parts of the following : **4×5=20**

(a) Bring out the salient features of phonocardiography.

(b) Explain the origin of different heart sounds.

(c) What is cysto scopes ?

(d) Write notes on sphygmomanometer.

(e) Give details specify about indirect measurement of blood pressure.

(f) Distinguish between P_{CO_2} and P_{CO_2} measurements.

4 Attempt any two parts of the followings : **2×10=20**

(a) What is a pneumotachograph ? Give its importance in pulmonary function analysis.

(b) Explain the Fick's method for the determination of cardiac output.

(c) Draw the block diagram of doppler blood flow meter and explain its operation.

5 Attempt any two parts of followings : **2×10=20**

(a) Describe a method to determine the total lung capacity.

(b) Describe a method to determine the concentration of oxygen in expired gas.

(c) Calculate the velocity of blood flow in a blood vessel using the following data. The velocity of ultrasonic waves in blood is 1500 m/sec. The angle between direction of the blood flow and the direction of incident ultrasonic beam is about = 30^{o}. The doppler shift in frequency is about 231 Hz when the incident ultrasonic frequency is 2MHz.