Paper / Subject Code: 32308 / Elective - I Biomedical Instrumentation

Time: 3 Hours **Marks: 80**

N.B.: 1.Question number 1 is compulsory.

2. Answer any 3 out of remaining 5 questions.

3. Figures to the right indicate full marks

Q1. a With the help of diagram, define various lung volumes and capacities. . **[20M]**

b State Beer Lambert's law with mathematical expression.

c. Explain principle of operation behind haemodialysis process.

d. Define CT number and mention any 2applications of CT scanning.

Q2. a. Explain working of ECG machine with 12 lead electrode configurations. **[10M]**

b. With the help of block diagram, **e**xplain working of heart lung machine and state its any 2 applications during surgery. **[10M]**

Q3. a. Draw block diagram and explain working of X-ray machine. Also state any 4 applications. **[10M]**

b. Explain working of Electromagnetic blood flow measurement technique. **[10M]**

Q4. a. Draw block diagram and explain working of EEG machine with 10-20 electrode system placement. **[10M]**

b. With the help of block diagram explain working of MRI machine and mentions its any 4 medical applications. **[10M]**

Q5. a. State any 4 characteristics of ultrasound waves and explain various modes of ultrasound imaging with each of example. **[10M]**

b. Define fibrillation and **e**xplain working of DC defibrillator .Mention any 2 applications of it. **[10M]**

Q6. Write a short note on: (Any Three) **[20M]**

a. Dye dilution and thermo dilution method for cardiac output measurement
b. Occurrence of heart sounds and its measurement technique
c. Working and application of Coulter's blood cell counter
d. Working of baby incubator and it's any 2 applications

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