MASTER OF TECHNOLOGY (ELECTRONICS - VLSI) (CBCS - 2015 COURSE)
M. Tech. (Electronics - VLSI) Sem-IV :SUMMER- 2022
SUBJECT : SELF-STUDY PAPER-II:BIOMEDICAL INSTRUMENTATION

Day : Wednesday
Date : 15-06-2022

S-14539-2022

Time : 10:00 AM-01:00 PM
Max. Marks : 60

N.B:

1) All questions are **COMPULSORY.**
2) Figures to the right indicate **FULL** marks.
3) Both the sections should be written in **SEPARATE** answer books.
4) Draw neat labeled diagrams **WHEREVER** necessary.

SECTION-I

Q.1 **a)** Draw and explain the cell structure. What is the function of cell membrane? **(05)**
b) What do you mean by central nervous system and peripheral nervous system? What are its parts? **(05)**

OR

Q.1 **a)** What are the parts of digestive system and their functions? **(05)**
b) Enlist the properties of muscular system and functions. **(05)**

Q.2 **a)** What is the normal frequency range of ECG signal? What are the characteristics of ECG preamplifier? **(06)**
b) Why Electrocardiography is called 12 lead systems? Justify. **(04)**

OR

Q.2 Explain in detail precordial leads and their positions on heart. Also draw ECG waveform at each position. **(10)**

Q.3 **a)** Define blood pressure. Explain the standard procedure to monitor blood pressure with the help of sphygmomanometer. **(06)**
b) Name the sensor used to monitor SPO_2 and explain its principle. **(04)**

OR

Q.3 What types of probes are used in direct B.P. measurements? Explain any one type of direct B.P. measurement technique with diagram. **(10)**

SECTION-II

Q.4 What do you mean by spirometer? Why it is used? Describe Ultrasonic spirometer with its working principle. **(10)**

OR

Q.4 Name the organs participate in respiration. Explain the function of each organ and define the process of gaseous exchange. **(10)**

Q.5 **a)** What is Beer-Lambert Law and principle used to design clinical instruments? **(05)**
b) What is intra-arterial blood gas monitoring? Describe catheter tip electrode for measurement of PO_2 and PCO_2. **(05)**

OR

Q.5 Enlist the types of blood cells and its normal range. What is microscopic method and what are its drawbacks over automatic optical method. **(10)**

Q.6 Explain the principle of surgical diathermy machine with diagram and types of waveforms generated by it. Mention the normal frequency range of each waveform. **(10)**

OR

Q.6 Give the importance of grounding and explain grounding configurations for patient safely. **(10)**

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