Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
MID TERM EXAMINATION - APR 2023

Semester : Semester VI - B.Tech ECE - 2020
Course Code : ECE3034
Course Name : Sem VI - ECE3034 - Biomedical Instrumentation
Program : B.Tech. Electronics and Communication Engineering

Date : 15-APR-2023
Time : 2:00PM - 3:30PM
Max Marks : 60
Weightage : 30%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS **(5 X 2 = 10M)**

1. List the various types of commercially available thermocouples along with their commercial names and range of operating temperature

(CO1) [Knowledge]

2. As an electronic engineers, we know that many types of pre amplifiers are available, Can you name a pre amplifier where the adjustment of the gain is possible

(CO1) [Knowledge]

3. Discus about the necessity of a transducer in medical field

(CO1) [Knowledge]

4. Differentiate between thermocouple and thermistor with respect to size, application, operational range and their feasibility to BMI

(CO1) [Knowledge]

5. Name the instrument which is specifically used for the measurement of pulse rate

(CO2) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **(3 X 10 = 30M)**

6. Potentiometric transducers are very old and efficient transducers which convert linear or rotational displacement in to voltage. They work on the principle that resistance of the conductor changes with change in the length of the conductor. In view of the above concept discuss the role and application of a potentiometric transducer in Bio medical Instrumentation.

(CO1) [Comprehension]

7. There are many methods of patient monitoring system, Out of them cardiac monitor is a very important monitoring system, where the patient is treated in separate reservedd area of hospital called Cariac Care Units. In CCU, Condition of the heart is continously monitored. explain The method of cardiac monitor in detail

(CO2) [Comprehension]

8. Piezoelectic transducers are very important in the area of converting the applied pressure into corresponding electrical voltage. They are mainly used near toles to convert the pressure of standing vehicles in to equivalent electrical voltage. With respect to the above context derive an equation and explain to show applied pressure is directly proportional to electrical output voltage in piezoelectric transducer

(CO1) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS **(2 X 10 = 20M)**

9. All the Cardiac Care units will be equipped with a display using CRT. There are a lot of differences between CRT that we are using in our Engineering lab and CRT used in medical field. Giving these differences and with a neat block diagram, explain an oscilloscope display system incorporating digital storage

(CO2) [Application]

10. Strain gauges are the transducers which convert the applied stress into corresponding change in resistance. This stress can be measured in terms of pressure and strain gauges play a very important role in the field of direct method of blood presssure measurement, with the help of a neat diagram, explain the operation of blood pressure measurement using strain gauge and diaphragm

(CO1) [Application]