

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS-2022

B. Tech-IV Semester (ECE)

COURSE CODE: 18B1WEC841

MAX. MARKS: 25

COURSE NAME: Bio Electronic Sensors

COURSE CREDITS: 3

MAX. TIME: 1 Hour 30 Min

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q1. Describe the following terms

[4]

- a) ECG b) EEG c) EMG d) Bourdon Tube

Q2. Explain the construction, working and input output characteristics of LVDT with the help of suitable diagram. What are its applications? Can we use it to measure pressure? Explain

[4]

Q3. a) Define calibration. Explain different types of calibration with diagrammatic representations.

[3]

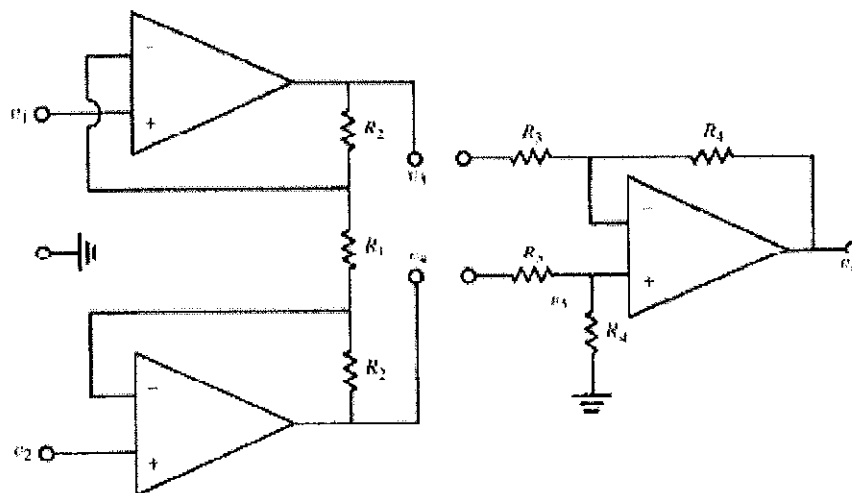
b) Can calibration be useful in reducing i) random errors ii) systematic errors? Why or why not?

[2]

Q4. (a) Explain the concept of virtual ground with respect to ideal operational amplifier (use diagrams and usual symbols).

[2]

(b)



An Op-Amp differential amplifier (as in figure above) is built using four identical resistors, each having a tolerance of $\pm 5\%$. Calculate the worst possible CMRR.

[4]

Q5. Design differentiator circuit using OpAmp, which takes 2V(peak to peak) sine wave input and produces a 4 V (peak to peak)cosine wave at the output. [3]

Q6. As a biomedical R &D engineer working in a company, you are tasked to design a detector circuit for detecting R wave (5V peak) in the ECG waveform. The output should be a pulse of 5 V. Design the Circuit using Operational Amplifier (ideal) and suitable values for other circuit components as required. [3]

T2 Examinations April 2022