DEPARTMENT OF COMPUTER SCIENCE

B.Sc. (Comp. Sc.) Electronics (First Year)

Semester II EXAMINATION

Subject code: USCSEL 121 **Paper Title:** INSTRUMENTATION SYATEMS

Time: 2 Hours **Maximum marks: 35**

Instructions to candidates:

1. All question are compulsory
2. Draw neat labelled diagram wherever necessary
3. Figure to the right indicate full marks
4. Use of non-programmable calculator is allowed

Q.1) **Answer any five of the following:** **[1x5=5]**

a. What is active sensor?

b. Define actuator.

c. State any two applications of Instrumentation system.

d. State different types of motors.

e. Which type of signal conditioning is required for thermistors?

f. Write name of the temperature sensor IC.

g. Draw symbol of operational amplifier.

Q.2) **Answer any five of the following:** **[3x5=15]**

a. Define the following with respect to OpAmp:

I. CMRR

II. input impedance

b. Draw diagram of OpAmp as non-inverting amplifier and derive an expression for the output of this circuit.

c. Draw neat block diagram of control system and explain.

d. Define any three characteristics of a sensor. → sensitivity linearity accuracy

e. Explain working principal of LDR with neat structure diagram. State material used and one application of LDR.

f. What is motor? Draw diagram of construction of D.C. motor.

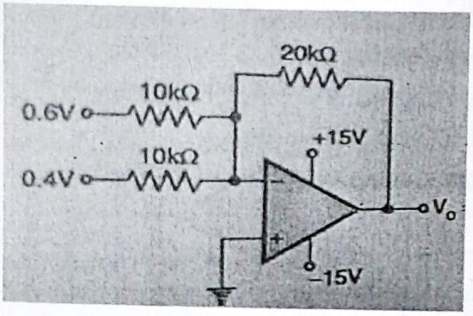
g. If Op amp has common mode gain as 10 and differential mode gain 1000, find CMRR in dB.

Q.3) Answer any three of the following: **[5x3=15]**

a. With the help of circuit diagram explain voltage to current converter.

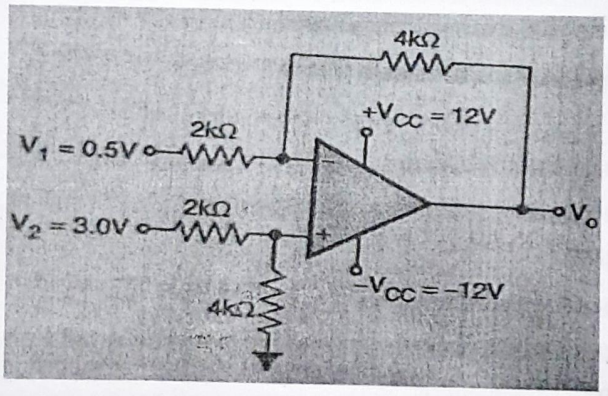
b. Explain working of stepper motor using neat, labeled diagram.

c. Identify the following circuit and find output voltage of this circuit.



d. i) Identify the following circuit and find output voltage for the given input values in the circuit diagram.

ii)If input values are changed to V1= 1.0 V and V2= 4.0 V what will be the output?



e. With neat diagram explain principle of operation of ultrasonic sensor.