Total No. of Questions : 5]

SEAT No. :

PA-1006

[Total No. of Pages : 3

[5902]-25
F.Y. B.Sc. (Computer Science)
ELECTRONICS
ELC - 121 : Instrumentation System
(New 2019 Pattern) (Semester - II) (CBCS) (Paper - I)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Figures to the right indicate full marks.***
4) ***Draw neat diagrams wherever necessary.***
5) ***Questions 2 to 5 carry equal marks.***

Q1) Solve any five of the following. **[5×1=5]**

a) What is full form of CCD?

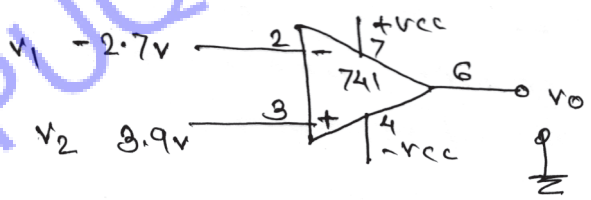
b) What is sensor? Give any one example.

c) Define dark Resistance w.r.t to LDR.

d) What is input offset voltage?

e) What is thick flim sensor?

f) Find the output of the following circuit.



Q2) a) Attempt any two of the following: **[2×3=6]**

i) Write short note on Tilt Sensor.

ii) With the help of neat diagram, explain working principle of stepper motor.

iii) What is Flim sensor? Which are two types of flim sensor? Give any two application of flim sensors.

b) Draw the circuit diagram of op.Amp as subtractor and drive the expression for its output voltage. **[1×4=4]**

P.T.O.

Q3) a) Attempt any two of the following: **[2×3=6]**

i) State working principle of ultrasonic sensor. State any two application of ultrasonic sensor.

ii) Draw smart instrumentation system. Give two advantages.

iii) What is thermistors? Give the equation of resistance change with respective to temperature for thermistor.

b) Draw the circuit diagram of op-Amp as adder and drive the expression for its output voltage. **[1×4=4]**

Q4) a) Attempt any two of the following: **[2×3=6]**

i) Draw the block diagram of an Op-Amp and explain.

ii) Write a short note on PIR sensor.

iii) In Non inverting amplifier vin = 6.5v where RF = 24k, R = 4kΩ find the value of

1) Output voltage

2) Voltage gain

b) Explain LDR on the basis of the following points:- Working principle, structure and symbol, material used, its application. **[1×4=4]**

Q5) Attempt any Four of the following: **[4×2.5=10]**

a) What is transduer? Define following with respective to sensor.

i) Accuracy

ii) Sensitivity

b) Explain working principle of DC motor.

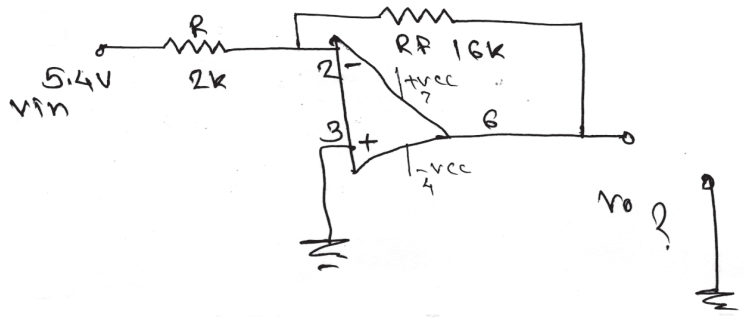
c) Write a short note on LM-35.

d) What is nanosensors? How nanosensors are fabricated? Give any limitation of nanosensors.

e) Explain the concept of virtual ground in Op-Amp.

f) Identify the following Op-Amp configurations and find their output voltages.

i)



ii)