Total No. of Questions : 5]

SEAT No. :

P5133

[Total No. of Pages : 2

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F.Y.B.Sc. (Computer Science)
ELECTRONIC SCIENCE
ELC - 121 : Instrumentation Systems
(Semester - II) (New CBCS 2019 Pattern) (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) Define actuator with one example.
b) State any two applications of PIR sensor.
c) Draw the circuit diagram for unity gain amplifier using opamp.
d) Calculate the output voltage of LM35 for 45ºC temperature.
e) Which are two types of film sensors?
f) Draw the symbol of OPAMP and lebel it.

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

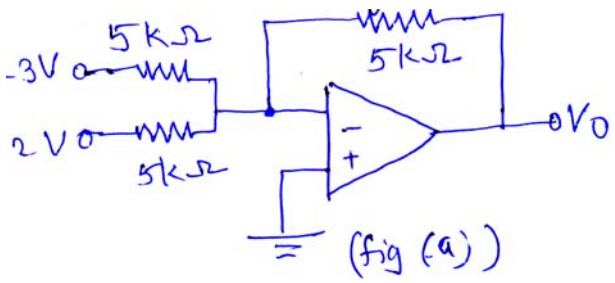
i) Describe block diagram of instrumentation system.
ii) Describe working of CCD image sensor.
iii) Draw smart instrumentation system. Give two advantages.

b) Draw circuit diagram of op-amp based voltage to current converter and explain its working. **[1×4=4]**

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

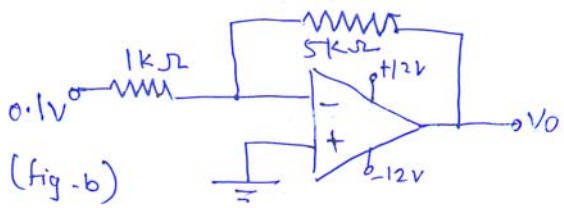
i) Explain working principle of ultrasonic sensor and state any two applications.
ii) Explain the concept of nano sensor.
iii) Explain the working of PIR sensor.

b) Identify the following configurations and find their output voltage. **[1×4=4]**



(fig (a))

P.T.O.



(fig -b)

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

i) Discuss the concept of active and passive sensors with example.

ii) Draw the circuit diagram of non-inverting amplifier for op-amp. Derive the expression for its output voltage.

iii) Explain op-amp as comparator.

b) Explain construction and working of DC motor. **[1×4=4]**

Q5) Attempt any four of the following. **[4×2.5=10]**

a) Define the following term for sensor.

i) Resolution.

ii) Linearity.

b) Explain working principle of tilt sensor.

c) List any five features of LM35 temperature sensor.

d) Draw the block diagram of op-amp. State ideal value of input offset voltage.

e) State any five advantages of smart sensor.

f) Explain the concept of virtual ground with neat diagram.

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