F.Y.BSc-(CS) Oct/Nov 2023.

[Total No. of Questions: 5] SEAT No. :

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

Q.1) Solve any five of the Following. **[5×1=5]**

a) Define the term: Slew Rate.

b) List any two temperature sensors.

c) Define Sensor with one example.

d) Which are two types of film sensor?

e) Draw the op-amp as Unity Gain Follower.

f) Actuators are output devices - State True or False.

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

i) Explain Instrumentation system with the help of block diagram.

ii) Explain working principle of stepper motor with the help of suitable diagram.

iii) Draw typical smart sensor. Give features of smart sensor.

b) Draw diagram of Inverting amplifier using op-amp. Derive an expression for the output. **[1×4=4]**

P.T.O.

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

i) Explain with neat diagram working principle of PIR sensor.

ii) State the techniques use for thin film fabrication. List application domains of Thin film sensors.

iii) Explain LM35 temperature sensor using neat diagram.

b) A non-inverting OP-AMP has input resistance of 6.8KΩ and Feedback resistance 68KΩ. If the input voltage is 0.5V. What is the Output voltage of op-amp. **[1×4=4]**

Q.4) **a) Attempt any two of the following:** **[2×3=6]**

i) What is virtual ground? Explain in detail.

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

iii) Differentiate between sensor and transducer.

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

Q.5) **Solve any four of the Following:** **[4×2.5=10]**

a) Define the following term for sensor: i) Accuracy ii) Resolution

b) Explain working principle of LDR.

c) Draw the block diagram of op-amp. State ideal value of Bandwidth.

d) State any five advantages of Smart sensors.

e) Explain V to I converter.

f) Give any four applications of temperature sensor.