Total No. of Questions : 4]

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F. Y. B.Sc. (Computer Science)

ELECTRONICS

ELC-101–T: Principles of Analog Electronics

(Rev. 2024) (Semester - I)

Time : 2 Hours] *[Max. Marks : 30*

Instructions to the candidates :

1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*
3) *Draw neat and labelled diagram wherever necessary.*
4) *Use of scientific calculator are allowed.*

Q1) Answer the following questions (any 5). **[5 × 1 = 5]**

a) What do you mean by doping?

b) Draw symbol of PNP and NPN transistor.

c) What is relation between '3' currents of transistor?

d) Give the material used for making crystal oscillator.

e) What is accuracy with respect to DAC?

f) What is difference between active and passive sensor?

g) Define range with respect to sensors.

P.T.O.

Q2) Answer the following questions (any 5) : **[5 × 2 = 10]**

a) Define step angle of stepper motor. Find number of steps for one rotation if step angle is 36°.

b) Derive relation of α in terms of β.

c) Explain working principle of zener diode in brief.

d) Explain the action of pn-junction diode when forward bias is applied to it.

e) Define oscillator. State Barkhausen criteria for sustained oscillations.

f) Find output voltage of R-2R ladder type DAC if binary input is 1010 and V_{ref}=12v.

g) Explain working principle of thermistor.

Q3) Answer the following questions (any 2) : **[2 × 5 = 10]**

a) What is the need of ADC and DAC in instrumentation system. Explain any three parameters of ADC.

b) Give atleast 5 points to distinguish between CC,CB and CE configurations.

c) Write any 5 ideal characteristics of op-amp.

Q4) Answer the following questions (any 2) : **[2 × 2½ = 5]**

a) What is dark current with respect to photodiode. Draw symbol of photodiode and give its two applications.

b) Draw and explain block diagram of instrumentation system.

c) Explain the concept of virtual ground in op-amp.

d) Draw circuit diagram of Wein bridge oscillator and find frequency of it. If R=5kΩ and C=0.01 μF