Total No. of Questions—**4**] [Total No. of Printed Pages—**3**

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S.Y. B.Sc. (Computer Sc.) (I Sem.) EXAMINATION, 2018

ELECTRONICS

Paper II

(ELC-212 : Analog Systems)

(2013 PATTERN)

Time : Two Hours **Maximum Marks : 40**

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Figures to the right indicate full marks.

(*iii*) Neat diagrams must be drawn wherever necessary.

(*iv*) Use of calculator is allowed.

1. Answer the following questions in *one* or *two* sentences each : [10×1=10]

(*a*) What do you mean by PIR sensor ?

(*b*) What do you mean by active sensor ?

(*c*) How many comparators are required for 3-bit flash ADC ?

(*d*) Find output voltage of LM-35 at 70°C.

(*e*) Find cut-off frequency of low pass filter if R = 1 kΩ and C = 0.1 μF.

(*f*) Give any *two* applications of tilt sensor.

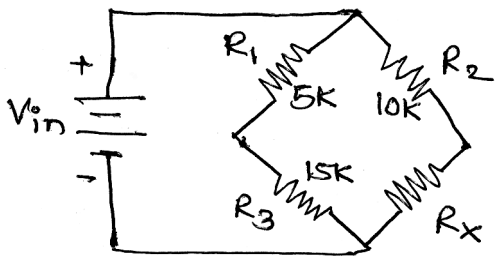
(*g*) Write any *two* salient features of instrumentation amplifier.

P.T.O.

(*h*) Define accuracy w.r.t. ADC.

(*i*) Write any *two* advantages of R-2R Ladder DAC.

(*j*) Find unknown resistance R_X, in balanced condition for the following figure :



2. Attempt any *two* of the following : [2×5=10]

(*a*) A 4-bit R-2R ladder network with 0 = 0V and 1 = 10 V. Find :

(*i*) Full scale output voltage

(*ii*) Analog output for digital input 1001

(*iii*) Analog output due to LSB change.

(*b*) Explain operating principle of LVDT with neat diagram.

(*c*) Differentiate between active and passive filters.

3. Attempt any *two* of the following : [2×5=10]

(*a*) Draw circuit diagram of voltage to frequency converter and explain its operation.

(*b*) Explain with diagram the case study of ECG.

(*c*) Explain the working principle of capacitive touch sensor and state any *two* applications of it.

4. Attempt any *one* of the following : [1×10=10]

(A) (*i*) Explain with neat diagram, principle of operation of pH sensor.

(*ii*) Explain the working of successive approximation ADC with neat diagram.

Or

(B) (*i*) Explain with neat diagram water level indicator system using float switch.

(*ii*) Draw the circuit diagram of instrumentation amplifier using 3 op-amp. Derive an expression for output voltage.