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

| **Seat No.** | |
|---|---|

# [5116]-106

**S.Y. B.Sc. (Computer Science)**

**(First Semester) EXAMINATION, 2017**

**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.

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

(*a*) Define the term 'Conversion time' with respect to ADC.

(*b*) For first order low pass filter calculate the cutoff frequency, if R = 10 k ohm and C = 0.001 microfarad.

(*c*) Give any *two* examples of optical sensor.

(*d*) Define the term active sensor.

(*e*) Find output current of AD 590 at 300 degree Kelvin temperature.

(*f*) What is the use of Wheatstone's bridge circuit in signal conditioning ?

P.T.O.

(*g*) Draw circuit diagram of op-amp as inverting amplifier.

(*h*) What is advantage of R-2R ladder DAC over binary weighted resistor DAC ?

(*i*) Write any *two* features of LM35.

(*j*) State any *two* applications of tilt sensor.

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

(*a*) Draw the circuit diagram of level shifter circuit and explain its working.

(*b*) With suitable diagram explain operating principle of LVDT.

(*c*) Draw circuit diagram of 4-bit R-2R ladder network DAC.

For a 4-bit R-2R ladder assume '0' = 0 volt and '1' = + 16 volts.

Find :

(*i*) Full scale analog voltage.

(*ii*) Analog voltage for 1011 digital input.

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

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

(*a*) Write the comparison between passive and active filters based on any *five* points.

(*b*) Explain block diagram of intruder detector system using PIR sensor.

(*c*) With neat block diagram explain the piezoelectric humidity sensor.

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

(*a*) (*i*) Explain the block diagram of analog electronic system.

(*ii*) Draw circuit diagram of op-amp based voltage to frequency converter (VFC) and explain its working.

*Or*

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

(*ii*) Draw simplified block diagram of ECG and explain its working.