(b) What are the output voltages caused by logic 1 in each bit position in an 8-bit ladder if the input level for 0 is 0 V and that for 1 is +10 V? (6)

(c) Write the sketch for the blinking LED with a delay of 5 seconds. (6)

6. (a) Write down the four applications of Arduino. (4)

(b) Explain the difference between an Arduino and a microcontroller. (4)

(c) How is the piezo-electric effect seen in some crystals used to make measurements? Explain with the help of a suitable diagram and equivalent circuit. (10)

7. (a) Explain the working of 555 timer as Astable multivibrator with the help of block diagram. (8)

(b) Design an astable multivibrator using 555 timer to generate a square wave of 5 KHz with 70% duty cycle. (6)

(c) Discuss the application of monostable multivibrator. (4)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 3030 **I**

Unique Paper Code : 2514002001

Name of the Paper : Electronic Circuits and Interfacing

Name of the Course : **B.Sc. (Hons. / Prog.) All Courses (GE III)**

Semester : III

Duration : 3 Hours Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Question No. **1** is compulsory.
3. Attempt **five** questions in all.
4. **All** questions carry equal marks.

1. (a) Why is an open loop operational amplifier unsuitable for linear applications? (3)

(b) What is the significance of feedback in Operational amplifiers? What is its effect on parameters and characteristics? (3)

(c) What are the differences between active and passive transducers (3)

(d) What is the function of ADC? Write down one application. (3)

(e) What is an all pass filter and where is it used? (3)

(f) A 6-bit DAC has a step size of 50 mV. Determine the full-scale output voltage and the percentage resolution. (3)

2. (a) How can we obtain a subtractor and a summing amplifier using a basic differential op-amp configuration? Explain with the help of circuit diagrams. (6)

(b) Design a differentiator to differentiate a signal having frequency 1 KHz. Draw output waveforms of a differentiator for inputs (i) triangular wave (ii) square wave. (6)

(c) Explain the working of Schmitt trigger and plot its hysteresis curve. (6)

3. (a) For a band pass filter with f_L = 200 Hz and f_H = 1KHz and pass band gain = 4. Calculate the value of Q and also specify type of band pass filter. (6)

(b) Design a Wein Bridge Oscillator to generate a signal of frequency 500 Hz. (6)

(c) Describe the working of a voltage to current converter circuit. (6)

4. (a) What are primary and secondary transducers? How are they different from each other? (6)

(b) A resistive potentiometer transducer is used for the measurement of displacement. The total length of the resistive track is 10 cm, the total resistance is 500 Ω, and the supply voltage is 15 V. When the wiper is 7.5 cm away from the upper end, calculate the output voltage. (6)

(c) Write a short note on the Hall Effect Sensor. (6)

5. (a) Explain the working of R-2R Ladder type Digital to Analog converter. (6)