

6. (i) Explain the operation of Successive Approximation ADC. Determine the binary equivalent of 5.25V for a SAR type DVM having 10-bits output with a reference voltage of +10V? (7)
- (ii) Draw circuit of 4-bit weighted type Digital to Analog converter. Give expression for its output. (6)
- (iii) Write a program to turn 'on' LED for 1ms and 'off' for 2ms repeatedly using Arduino. (5)
7. (i) What are the different types of strain gauges. Explain principle of working of anyone of them. (7)
- (ii) What is the difference between photo-emissive, photo-conductive and photo-voltaic transducer? (6)
- (iii) What is a pressure sensor? How does it work? (5)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 3332

I

Unique Paper Code : 2514002001

Name of the Paper : Electronic Circuits and Interfacing

Name of the Course : **B.Sc. (H) Electronics**

Semester : (Generic Elective ELGE-3A)

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. Attempt **five** questions in all. Question no. 1 is compulsory.
3. Use of Scientific non-programming calculators is allowed.

(3×6=18)

1. (i) Draw block diagram and voltage transfer curve of an operational amplifier.
- (ii) What are limitations of a basic integrator.

- (iii) List the important characteristics of an ideal operational amplifier and compare the ideal value with 741 operational amplifiers.
 - (iv) What is an IDE?
 - (v) What are important characteristics of an ADC (any three)?
 - (vi) What is a capacitive transducer? Write its one application.
2. (i) Design an inverting amplifier with gain 5. Assume feedback resistance value to be 10k Ω . Draw its circuit. (5)
- (ii) For the above circuit use operational amplifier 714C with given specifications : $A = 400,00$; $R_i = 33M\Omega$; $R_o = 60\Omega$; Unity gain bandwidth = 0.6MHz; Compute the closed loop parameters A_F , R_{iF} , R_{oF} and f_F , for the circuit. (7)
- (iii) How inverting amplifier is modified as a current to voltage and inverter? Give their circuits. (6)
3. (i) What are limitations of basic differentiator? Draw circuit of practical differentiator and explain its frequency response. (7)

- (ii) Design a circuit using operational amplifier to implement

$$V_o = -(V_a + V_b + V_c + V_d) / 4 \quad (6)$$
 - (iii) Write a short note on LM386. (5)
4. (i) Design an astable multivibrator using 555 timer to generate rectangular wave 10KHz frequency and 60% duty cycle. Draw output waveform and waveform of voltage across capacitor. (7)
- (ii) How an astable multivibrator circuit can be modified to generate square wave. (5)
- (iii) Draw the circuit diagram of Wein bridge oscillator and also write its designing equations. (6)
5. (i) Design a first-order high pass filter for a cutoff frequency of 10KHz and pass-band gain of 2. Draw its circuit and its frequency response. (7)
- (ii) Explain the working of non-inverting comparator? Draw necessary waveforms. (6)
- (iii) What is an all-pass filter? Draw its circuit. (5)