

**B.Tech Sem – IV(2007 Course) (Electronics) : SUMMER - 2019**  
**SUBJECT: LINEAR INTEGRATED CIRCUITS**

Day : Thursday  
Date : 30/05/2019

**S-2019-3026**

Time : 10.00 AM TO 01.00 PM  
Max. Marks: 80

**N. B. :**

- 1) **Q. No.1 and Q. No. 5 are COMPULSORY.** Out of remaining attempt **Any TWO** questions from each section.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answer to both the sections should be written in **SAME** Answer book.
- 4) Neat diagrams must be drawn **WHEREVER** necessary.

**SECTION-I**

- Q.1**
- a) Write a short note on current mirror circuit. (05)
  - b) Write the designing steps for practical integrator. (05)
  - c) Draw the circuit diagram for temperature compensated log amplifier. (04)
- Q.2**
- a) Discuss the necessity of DC level shifter in OPAMP. Describe any three circuits used for level shifting stage. (07)
  - b) Draw the basic block diagram of an OPAMP and discuss the function of each block in detail. (06)
- Q.3**
- a) Draw the circuit diagram of an instrumentation amplifier using transducer bridge. Derive the expression for output voltage. (07)
  - b) What are the disadvantages of ideal differentiator circuit? Draw a neat circuit diagram of practical differentiator circuit and state the equations for  $f_a$  and  $f_b$ . (06)
- Q.4**
- a) Discuss the working of sample and hold circuit. State its applications. (07)
  - b) Define the following terms related to comparator: (06)
    - i) Accuracy
    - ii) Logic threshold
    - iii) Response time

**SECTION-II**

- Q.5**
- a) Using multiplier IC discuss: (06)
    - i) Square root
    - ii) RMS detector
  - b) Define the following terms for PLL: (06)
    - i) Free running frequency
    - ii) Capture range
  - c) Draw the circuit diagram of I to V converter. (02)
- Q.6**
- a) With neat circuit diagram describe sawtooth waveform generator using OPAMP and derive the equation for its frequency of oscillation. (07)
  - b) Draw and explain functional block diagram of IC 8038 as function generator. (06)
- Q.7**
- a) Calculate free running frequency, lock range and capture range for PLL, if supply voltages are  $\pm V = \pm 10V$ ,  $R_1 = 10K\Omega$ ,  $C_2 = 10\mu F$  (low pass filter) and  $C_1 = 0.01\mu F$ . (07)
  - b) Discuss the applications of power amplifier IC like LM380 in audio power amplifier. (06)
- Q.8**
- a) Describe the operation of IC LM331 as V to F converter. (07)
  - b) Discuss V to I converter for grounded load. (06)

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