

**B.TECH SEM – IV(2007 COURSE) (ELECTRONICS) :**  
**WINTER - 2017**  
**SUBJECT : LINEAR INTEGRATED CIRCUITS**

Day : **Thursday**  
Date : **23/11/2017**

Time : **02.30 PM TO 05.30 PM**  
Max. Marks : **80**

**W-2017-2418**

**N. B. :**

- 1) **Q. No. 1 and Q. No.5 are COMPULSORY.** Out of the remaining attempt **Any TWO** questions from each sections.
- 2) Answers to the two sections should be written in **SEPARATE** answer books.
- 3) Figures to the right indicate **FULL** marks.
- 4) Draw neat and labeled diagrams **WHEREVER** necessary.
- 5) Assume suitable data, if necessary.

**SECTION - I**

- Q.1** a) Write a short note on Wilson current source. **(05)**
- b) What are the basic requirements of a good instrumentation amplifier? **(04)**
- c) Draw and explain inverting comparator circuit with waveform. **(05)**
- Q.2** a) What is the need of level shifting network in op-amp? Explain any 3 various level shifting networks which are used in an op-amp. **(07)**
- b) Draw the circuit diagram and discuss the input bias current compensation technique. **(06)**
- Q.3** a) Draw and explain the commonly used three op-amp instrumentation amplifier circuit. Derive expression for its gain. **(07)**
- b) Design a practical differentiator circuit that will differentiate an input signal with the  $f_{\max} = 150 \text{ Hz}$ . **(06)**
- Q.4** a) Design an op-amp Schmitt trigger with the following specification : **(07)**  
UTP = 2V, LTP = -4V and the output swings between  $\pm 10V$ .
- b) Explain the operation of full wave precision rectifier with neat diagram and waveforms. **(06)**

**P.T.O.**

## SECTION - II

- Q.5 a)** Discuss the following applications of a multiplier IC with suitable diagrams : **(04)**  
i) Division of two voltages  
ii) True rms detection
- b)** A 555 timer is configured to run in astable mode with  $R_A = 4K\Omega$ ,  $R_B = 4K\Omega$  and  $C = 0.01 \mu F$ . Determine the frequency of output and duty cycle. **(06)**
- c)** Explain photo detector circuit as an application of I to V converter. **(04)**
- Q.6 a)** Draw PIN diagram for IC 8038 and discuss the function of each pin in details. **(07)**
- b)** Explain the working of astable multivibrator using op-amp. Draw waveforms. **(06)**
- Q.7 a)** Discuss the operation of intercom system using IC LM380 with its circuit diagram. **(07)**
- b)** With the help of neat diagram explain the principle of operation of phase locked loop. **(06)**
- Q.8 a)** Draw the circuit diagram for frequency to voltage converter using IC 331 and explain its working in detail. **(07)**
- b)** Explain voltage to current converter with floating and with grounded load with circuit diagram. **(06)**

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