

**COMP 3 – 6 (RC)**

**S.E. (Computer) (Semester – III) (RC) Examination, May/June 2014**  
**INTEGRATED ELECTRONICS**

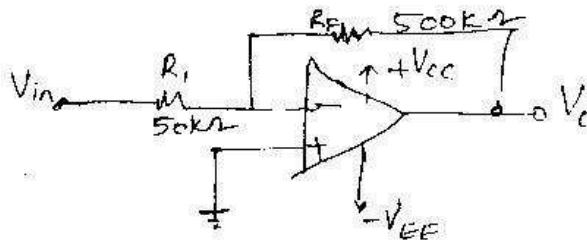
Duration : 3 Hours

Total Marks : 100

**Instructions :** 1) Attempt **any 5**, choosing **atleast one** from **each** Module.  
 2) **Assume** any data, **if necessary**.

**MODULE – 1**

1. a) With the help of a diagram explain the working of an integrator. What are the drawbacks and how are they overcome? 6
- b) What is a feedback ? Explain the types of feedback. Which type is used in linear applications? 5
- c) Write a note on the freq. response of a opamp. 4
- d) If an input signal of  $-0.5\text{V}$  were applied, determine the output voltage for the circuit shown below : 5



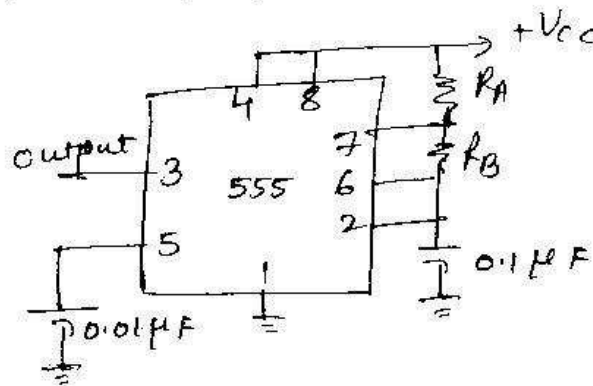
2. a) Explain the working of a noninverting comparator. 4
- b) Define the following :  
 input offset voltage, slew rate, SVRR. 5
- c) Draw the circuit diagram of voltage series feedback amplifier and derive an expression for
  - i) Voltage gain
  - ii) Input impedance
  - iii) Output impedance
  - iv) Total output offset voltage. 7
- d) Draw the block diagram of a instrumentation amplifier. 4

P.T.O.



## MODULE – 2

3. a) Write a note on the following : 8
- Phase detector
  - Low pass filter.
- b) Draw a circuit of a voltage regulator based on IC 723 for a higher current rating and a higher output voltage (greater than 10V). 6
- c) Explain the working of IC 555 as a monostable multivibrator. 6
4. a) Explain the various applications of PLL. 6
- b) Design a low voltage regulator for the following specifications.  
 $V_0 = 5V$ ,  $I_m = 50 \text{ mA}$ ,  $V_{in} = 10V$ ,  $T_A = 25^\circ\text{C}$ ,  $V_{\text{sense}} = 6.65V$ . 4
- c) In fig.  $R_A = 2.2k\Omega$ ,  $R_B = 3.9k\Omega$  and  $C = 0.1 \mu F$ . Find out the pulse width of positive and negative pulses. Also calculate the free running frequency. 4



- d) Briefly, explain the block diagram of IC 555 timer. 6

## MODULE – 3

5. a) Explain propagation time delay and noise margin w.r.t. digital logic. 5
- b) Describe the 3-input HTL NAND gate with fan-out of N similar gates along with a neat circuit diagram and give its advantages. 8



- c) List the characteristics of a CMOS circuit and explain CMOS inverter and verify the operation is performed for all input combinations. **7**
- 6. a) Along with a circuit diagram 3-input TTL NAND gate, explain its operation. **8**
  - b) Mention the advantages of ECL gate and give the symbol for ECL OR/NOR gate. **6**
  - c) Give advantages and disadvantages of DTL gate and draw the circuit diagram for 3-input DTL NAND gate. **6**

**MODULE – 4**

- 7. a) Explain the successive approximation method of analog to digital conversion. Discuss the working of ADC using this method. **8**
  - b) Define the following specifications of data converters with suitable example : **8**
    - i) Resolution
    - ii) Accuracy
    - iii) Linearity error
    - iv) Settling time.
  - c) Mention the applications of A/D and D/A are used. **4**
- 8. a) Explain the voltage to frequency converter and derive the necessary expressions for analog to digital conversion. **6**
  - b) What is the resolution in volts of a 12 bit binary ladder DAC, if its full scale output voltage is + 10V and find the percentage resolution ? **7**
  - c) Explain the waveforms of dual-slope A/D converter and give its advantages and disadvantages. **7**