CBCS Scheme

15EC46

Fourth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Linear Integrated Circuits

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. Define following terms with respect to opamp and mention the typical values of opamp 741:
(i) PSRR, (ii) CMRR, (iii) Slew rate, (iv) input voltage range and output voltage range.
(08 Marks)

 b. Compare emitter follower with voltage follower. **(04 Marks)**

 c. A voltage follower using 741 opamp is connected to signal source with resistance of
$R_s = 47$ KΩ. Calculate suitable value of resistor R_1 and also maximum voltage drop across
each resistor and maximum input offset voltage produced by input offset current.
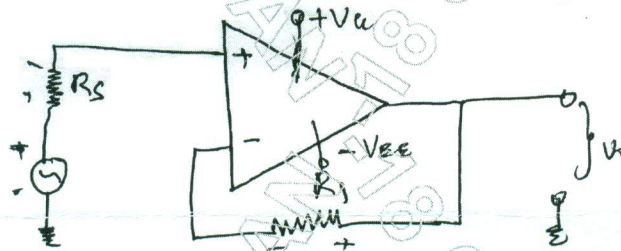

Fig.Q1(c) **(04 Marks)**

OR

2 a. Derive output voltage equation of 3 input non inverting summing circuit and show how it
can be converted into averaging circuit. **(08 Marks)**

 b. An operational amplifier circuit with closed loop gain is 100 and common mode output
voltage is 5 mV and common mode input is 5 mV, determine common mode rejection ratio.
(02 Marks)

 c. Explain the operation of a basic op-amp circuit. **(06 Marks)**

Module-2

3 a. Explain capacitor coupled voltage follower circuit. **(08 Marks)**

 b. Design a precision voltage source to provide an output of 9 V the available supply is ±12V
allow approximately ±10% tolerance on Zener diode voltage. **(08 Marks)**

OR

4 a. Design an instrumentation amplifier to have an overall gain of 900. The input signal
amplitude of 15 mV, 741 opamp is to be used. Supply is ±15V. **(08 Marks)**

 b. Explain high Zin capacitor coupled non inverting amplifier with design steps. **(08 Marks)**

Module-3

5 a. Explain precision clipping circuit. **(08 Marks)**

 b. Explain log amplifier and derive its output voltage equation. **(08 Marks)**

OR

6 a. Using 741 opamp with supply voltage of ±12V design Schmitt trigger to have trigger points ±2V. (06 Marks)

   b. Explain sample and hold circuit using of opamp. (10 Marks)

Module-4

7 a. Explain second order active low pass filter and also write design equations. (08 Marks)

   b. Explain the function diagram of 723 general purpose regulator IC. (08 Marks)

OR

8 a. Design a second order active high pass filter using 741 opamp with cutoff frequency of 12 kHz. (06 Marks)

   b. What is meant by line regulation and load regulator with respect to IC regulators and mention the characteristics of 3 terminal IC voltage regulators. (06 Marks)

   c. Design a first order active low pass filter to have cutoff frequency of 1 kHz. Use 741 opamp. (04 Marks)

Module-5

9 a. Explain the operation of a Astable multivibrater using 555 timer. (08 Marks)

   b. Explain operation of PLL with block diagram. (08 Marks)

OR

10 a. Explain the operation of a VCO. (08 Marks)

    b. Explain analog to digital conversion using successive approximation method. (08 Marks)

* * * * *