

FACULTY OF ENGINEERING
B.E. 3/4 (ECE) I-Semester (Main) Examination, November 2013

Subject : Linear Integrated Circuits and Applications

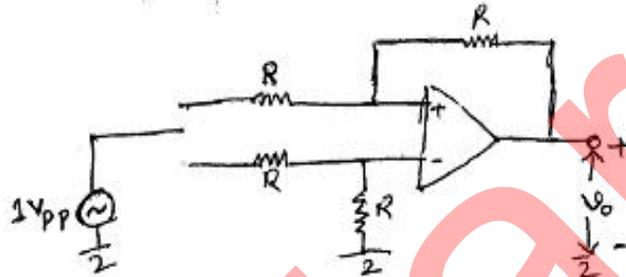
Time : 3 Hours

Max. Marks: 75

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1. What is a level translator circuit? Why is it used with cascade differential amplifier stages? (2)
2. Define slew rate. Explain its significance and give its typical value for $\mu A741$ IC. (3)
3. Explain why open-loop op-AMP configuration is not used for linear applications. (3)
4. For the circuit shown below compute the output. Assume the OP-AMP is ideal one. (2)



5. What are the advantages of active filters over passive filters? (2)
6. Explain the operation of Schmitt trigger circuit using operational amplifier. (3)
7. Draw the functional block diagram of IC565 and mention its important features. (3)
8. Calculate the frequency of oscillation of an IC 566 VCO for external components $R_T = 6.8 \text{ k}\Omega$, $C_T = 470 \text{ pf}$. Assume other component values if necessary and draw the circuit. (2)
9. Define (i) Resolution (ii) Accuracy (iii) Monotonicity of digital to analog converters (3)
10. Compare R-2R ladder and binary weighted resistor type Digital to Analog converters. (2)

PART – B (5x10=50 Marks)

- 11.(a) Draw the circuit diagram of a dual input balanced output differential amplifier configuration and perform the DC and AC analysis. (5)
 (b) Compare ideal and practical OP-AMP parameters. (5)
- 12.(a) Draw an OP-AMP summing amplifier circuit and obtain an expression for the output voltage. (3)
 (b) Draw the circuit of an ideal integrator and explain its operation. What are the limitations of an ideal integrator? How are these limitations can be overcome? (7)
- 13.(a) Draw and explain the second order low pass Butterworth active filter and also derive its voltage gain equation. (7)
 (b) Design a second order active high pass filter with cut-off frequency of 5KHZ and draw the circuit diagram. (3)
14. With the help of neat functional block diagram and waveforms. Explain the operation of IC 555 timer as an astable multivibrator. Derive the expression for its frequency of oscillation. (14)
- 15.(a) With neat functional block diagram explain the operation of IC 565. (5)
 (b) Draw the functional block diagram of IC 8038 function generator and explain its operation. (5)
- 16.(a) Design a voltage regulator to supply 6 volts at a load current of 200 mA using IC723 and explain the current limiting feature of this IC. (5)
 (b) Explain the working of R-2R ladder type D/A converter. (5)
17. Write short notes on the following: (10)
 (a) Successive approximation ADC
 (b) Instrumentation Amplifier (c) Precision diode