Roll No. ☐☐☐☐☐☐☐☐☐☐☐   **Total No. of Pages : 02**

Total No. of Questions : 09

B.Tech.(Electronics Engg.) (2012 Onwards)
B.Tech.(ECE/Electronics & Computer Engg./ETE) (2011 Onwards)
(Sem.–5)
LINEAR INTEGRATED CIRCUIT
Subject Code : BTEC-503
Paper ID : [A2105]

Time : 3 Hrs.   **Max. Marks : 60**

INSTRUCTION TO CANDIDATES :
1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.**

SECTION-A

1) Write briefly :

    a) Define the terms : input offset current, input bias current.

    b) Show how a potentiometer can be connected to an op amp circuit so that the output dc offset can be adjusted to its minimum value.

    c) Define CMRR and discuss its significance.

    d) Sketch the output waveform for a given input waveform to a comparator.

    e) State the Barkhausen criterion for oscillation.

    f) Discuss the differences between a Butterworth and a Chebyshev filter.

    g) Define the terms : full scale voltage and one least- significant bit for a D/A converter.

    h) Can a PLL be used as a FM detector?

    i) List the differences between Linear voltage regulator and Switching regulator.

    j) Draw the circuit of sample and hold circuit.

SECTION-B

2) Analyze the operation of true integrator circuit and explain the difficulties that arise from implementation with general purpose op amp. Also draw the frequency response of basic and practical integrators.

3) a) What is the main advantage of constant current bias over emitter bias?

   b) Explain the differences between constant current bias and current mirror.

   c) Why level translator is used with cascaded differential amplifier?

4) Obtain the expression for the output voltage e_o for the circuit shown :
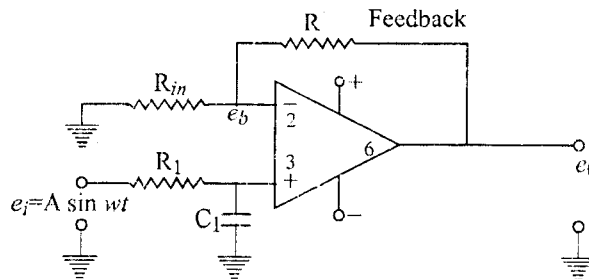
5) Draw the high frequency equivalent circuit of an op amp. Explain in detail the major sources responsible for capacitive effect. Also evaluate the expression for output voltage gain as a function of frequency.

6) What is a VCO? Explain its operation in detail using its block diagram. Also draw the connection diagram using IC 566 and its output waveforms.

SECTION-C

7) Draw the schematic diagram and analyze the operation of a Wein bridge oscillator and design the circuit for producing a specified output frequency. Also discuss how additional negative feedback can be applied to a Wein bridge oscillator to stabilize the loop.

8) Consider the Non inverting amplifier circuit shown using 741 op amp. The circuit is to be used to amplify some complex analog signals. Investigate the frequency limits of operation when the input signal has a peak value of (a) 20mV and (b) 500mV. Assume that B = 1MHz and S = 0.5V/μs.
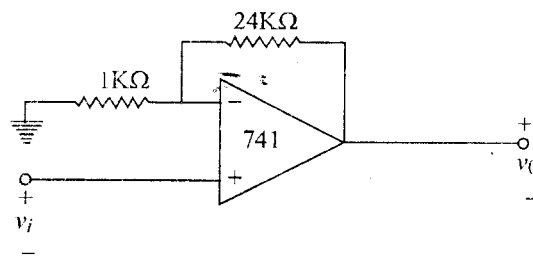
9) Draw the standard block diagram representation of a feedback amplifier and show how the inverting amplifier fits the model. Calculate the actual values of the low frequency closed loop gain, the input resistance, and the output resistance for a inverting op amp circuit.