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EC-226

B.E. IV Semester

Examination, June 2017

Choice Based Credit System (CBCS)

Integrated Circuits and its Application

Time : Three Hours

Maximum Marks : 60

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

1. a) What are the Advantages and Disadvantages of negative feedback?

   b) Derive the relevant expression to prove that input resistance increases and output resistance decreases in case of voltage series feedback.

2. a) What is Barkhausen criteria? Explain how oscillations start in an oscillator.

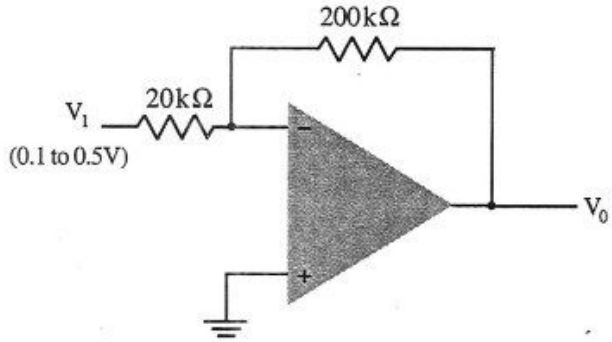
   b) Explain the construction and working of RC phase shift oscillator.

3. a) Find the frequency of the oscillations of a Colpitts oscillator having $C_1 = 150pF$, $C_2 = 1.5nF$ and $L = 50H$.

   b) Explain with the help of a circuit diagram, the working of an RC phase shift oscillator.

4. a) Draw the block diagram of an op-amp and write the function of each block.

   b) What is the range of the output voltage in the circuit of figure below if the input can vary from 0.1 to 0.5V?



5. a) Assuming slew rate for 741 is 0.5V/μsec. What is the maximum frequency of undistorted sine wave that can be obtained for
   i) 12V peak ii) 2V peak

   b) Define the following:
   i) CMRR ii) PSRR
   iii) Input offset current iv) Output voltage swing

6. a) It is desired to get an output using op-amp, given by the equation $V_0 = 5(V_1 - V_2) + 3V_3$. Design the circuit and draw the designed circuit.

   b) Draw and explain zero crossing detector with I/p and O/p waveform.

7. a) Design a low pass filter with a cut off frequency of 1kHz and with a pass band gain of 2.

   b) Draw the circuit of a first order Butterworth low pass filter and derive its transfer function.

8. Write short notes on any two:
   a) Active peak detector
   b) Op-Amp based Wein Bridge oscillator
   c) Voltage controlled oscillator

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