Sub: Analog Integrated Circuits and Applications 16/6/09

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3215-08. (REVISED COURSE) CO-2872

(3 Hours) [Total Marks : 100

(1) Question No. 1 is compulsory.
(2) Attempt any four questions from remaining six questions.
(3) Assume suitable data if required and state it clearly.

a) The 741C is used as an inverting amplifier with a gain if 50. The sinusoidal input signal has a variable frequency and maximum amplitude of 20mV peak. What is the max. frequency of the input at which the output will be undistorted ? 5

b) An inverting amplifier using the 741 C must have a flat response upto 40KHz. The gain of the amplifier 10. What maximum peak to peak input signal can be applied without distorting the output ? 5

Design a differentiator using op-amp to differentiate an input signal that varies in frequency from 10Hz to about 1 KHz. 5

c) Consider the circuit of Figure for the sinusoidal voltage shown as input, sketch the output voltage. Assume relatively low frequency operation so that slow rate effects are not apparent assume $\pm V_{sat} = \pm 13$ V. 5

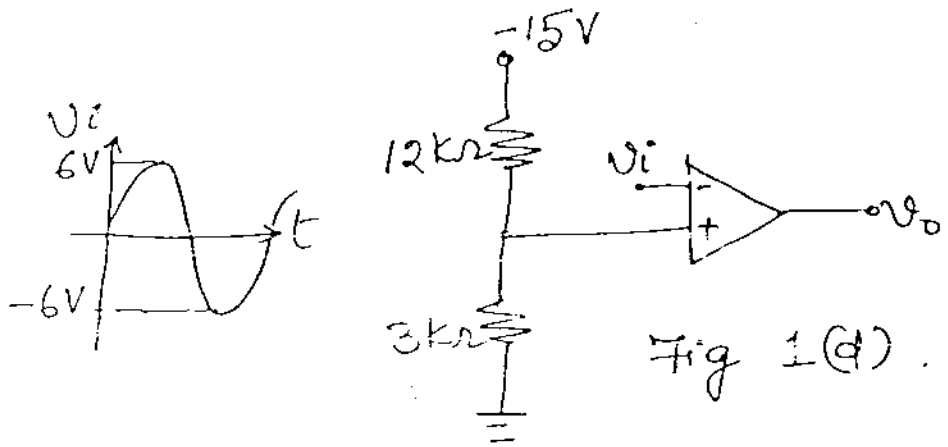
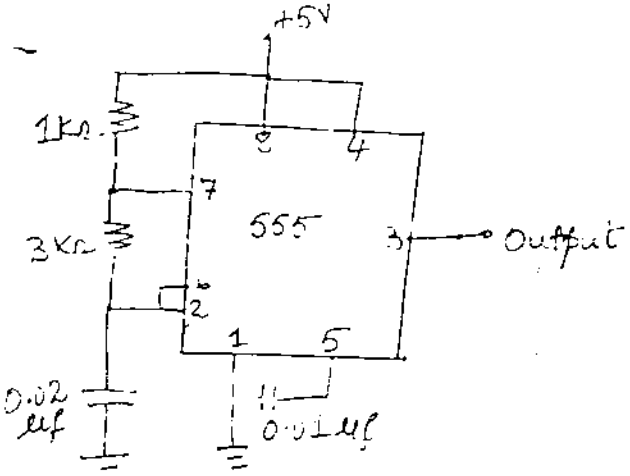


Fig 1(a).

Consider the 555 as table circuit in Figure. Determine the (i) highstate-time interval. (ii) low state-time interval (iii) period (iv) frequency and (v) duty cycle. 10



Draw the circuit diagram if three op-amp instrumentation amplifier. Get an-expression for the output. 10

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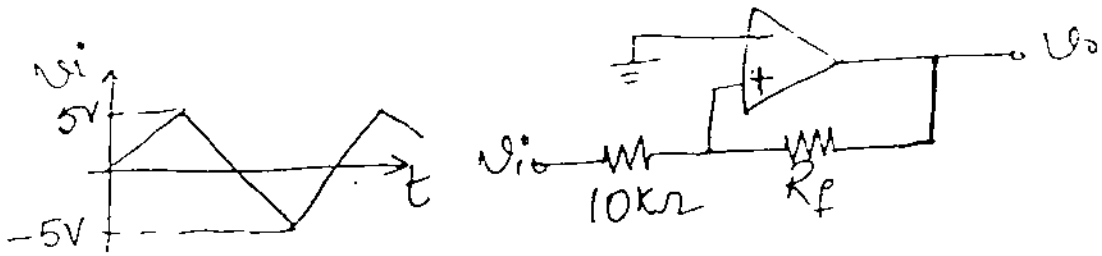
3. (a) What are switched capacitor filters ? Explain.
   (b) Draw and explain the circuit diagram to generate square and triangular wavefor using op-amp. Derive expression for frequency and comment about range frequency.

4. (a) Consider a non inverting Schmitt Trigger as shown. The input is the triangular wavefor of **Figure**. Assume that $\pm V_{sat} = \pm 13$ V. It is desired to produce a square wave which transitions occur exactly at the peaks of the input ($\pm$ 5V) (i) Determine th value of R_f required (ii) Sketch the output waveform.



   (b) Design Wein Bridge and RC phase shift oscillator to generate 20 KHz frequenc of oscillations. Draw the circuits.

5. (a) What are switching voltage regulators ? How are they different from linea regulators ?
   (b) Design a 1 amp. current source using a 7805 regulator IC.

6. (a) Why is an op-amp diode rectifier called as a precision rectifier ? Explain wit example and waveforms.
   (b) What is a sample and hold circuit ? Explain one type of ADC.

7. Write notes on (any **two**) :–
   (a) IC 723
   (b) IC 565
   (c) KRC filter.
