T. E. EXTC (V) (CBGS)

10/12/14

I C.

QP Code : 14979

[3 Hours] **[Total Marks: 80**

N.B. :(1) Question no. **1** is **compulsory.**
(2) Solve any **three** from the remaining **five** questions.
(3) **Figures** to the **right** indicate **full** marks.
(4) Assume suitable **data** if necessary and mention the same in the answer sheet.

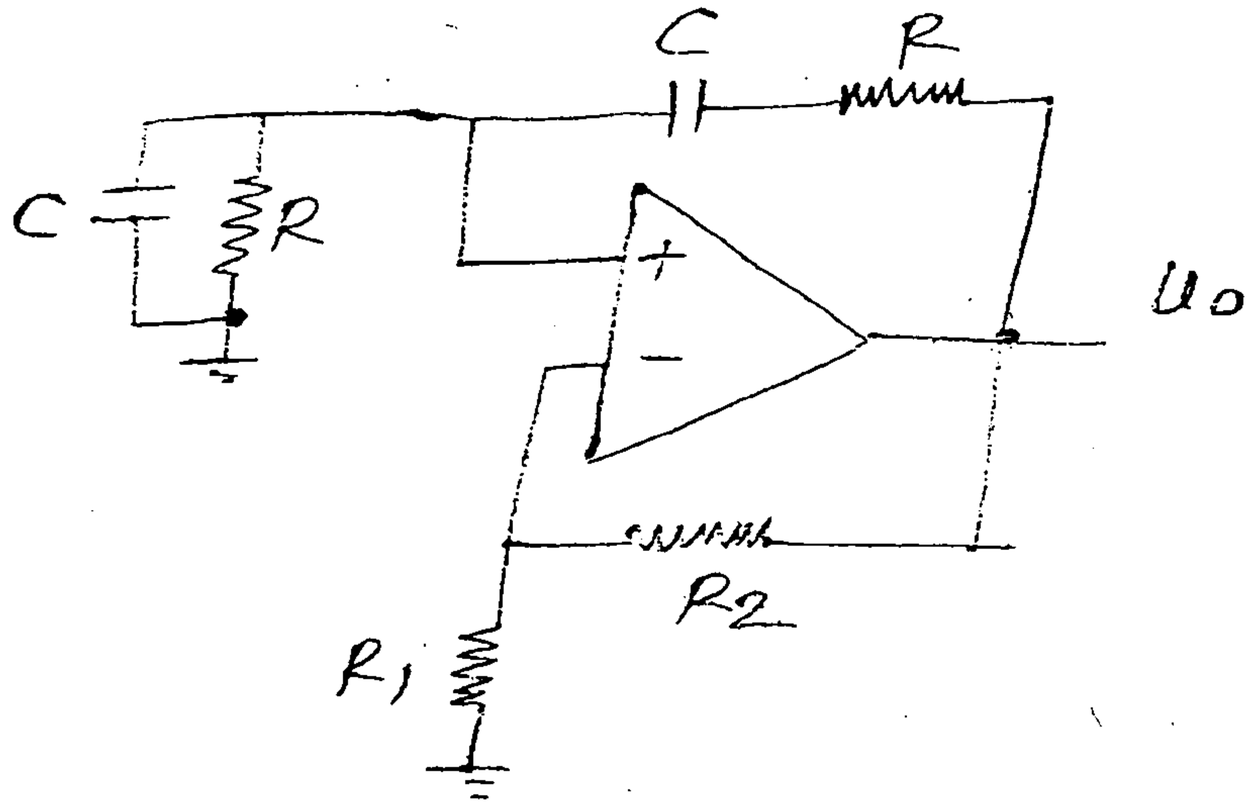
1. Solve any **five**:— **20**
   (a) What is input offset voltage and output offset voltage of an Op Amp. How to measure it practically.
   (b) With the help of a neat circuit diagram explain a voltage to current converter with ground load.
   (c) What is difference between ordinary rectifier and precision rectifier.
   (d) Explain any application of waveform generator XR2206 with the help of a neat diagram.
   (e) With the help of a neat diagram explain how current fold-back protection is achieved in voltage regulators.
   (f) Draw mod-10 counter using IC 7493.

2. (a) Draw the circuit diagram for a finite gain second order low pass filter. Obtain the expression for its transfer function. What is the effect of interchanging the resistance & capacitance in the circuit? **10**
   (b) What is the advantage of an instrumentation amplifier over a difference amplifier. Draw the circuit diagram for an instrumentation amplifier with variable gain using 3 op-amps and derive the expression for its output voltage. **10**

3. (a) With the help of a neat diagram and waveforms at the trigger input, across the capacitor and at the output, explain working of 555 as a Monostable multivibrator. Find the values width of 5ms. **10**
   (b) Draw the circuit diagram for a square and triangular waveform generator using op-amps. With the help of waveforms at suitable points in the circuit explain its working. If the duty cycle is to be varied, what modification is required in the circuit. If the output of the square wave is to be clipped to $\pm V_x$ how is if obtained? **10**

4. (a) With the help of a function block diagram explain the working of voltage regulator LM317 to give a output voltage variable from 6V to 12V to handle maximum load current of 500mA. **12**
   (b) Explain the difference between linear voltage regulator and switching voltage regulator. **4**

(c) Identify the circuit shown below and explain its working. 4



5. (a) Draw the circuit diagram for an Excess-3 decade counter using IC74163 and explain its working with the help of waveforms. 10
   (b) With the help of a neat circuit diagram explain the working of universal shift register IC 74194. 10

6. Write short notes on any **four**:— 20
   (i) Phase Locked Loop IC565
   (ii) Precision rectifier.
   (iii) Schmitt trigger.
   (iv) Sample & Hold circuit.
   (v) Window dectector.
