Timer for Students

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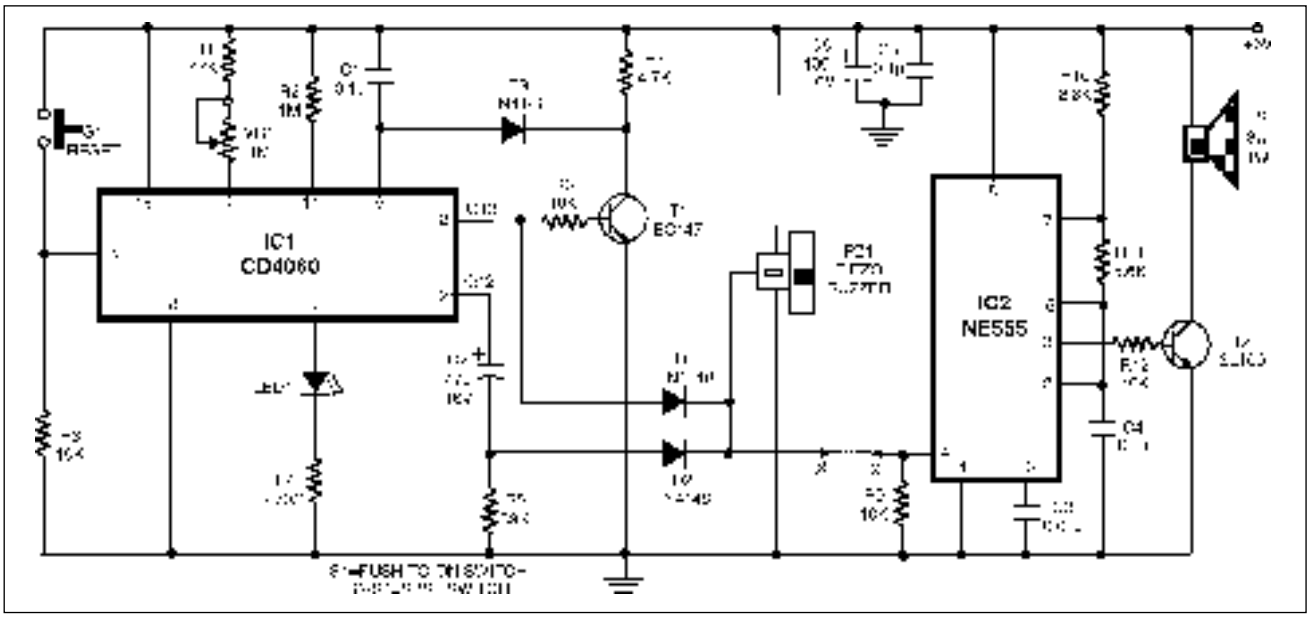
These are the days of competitive examinations. Nowadays, students are required to answer a set of objective type of questions in a given time which may extend to 15 minutes, 30 minutes, or one hour. Speed and accuracy win the race. Practice helps in achieving it.

Here is a timer that gives an alarm after a preset time of 30 minutes. It also gives out a few beeps at half the selected time period. The timer could be programmed for other periods as well. The alarm can be reset for a fresh start.

The heart of the circuit is a CMOS IC CD 4060. It has a built-in oscillator and a 14-stage divider, wherein the basic oscillator frequency is divided by 16,384. Here the oscillator frequency may be set using potmeter VR1 (in series with resistor R1) and capacitor C1. Potmeter VR1 is adjusted for a time period of 15 minutes at output Q12 (pin 2). The output Q13 (pin 3) will go 'high' after 30 minutes. Use a multi-turn potmeter for better accuracy.

When Q13 goes high, the 3-terminal piezo-buzzer becomes active and gives out a tone. This buzzer also beeps at half the time for a few seconds. Transistor T1 prevents further oscillations after the lapsed time. Red LED1 is used as activity indicator.

For simplicity, 6-volt supply is chosen for operation of the circuit. To obtain 6V supply one may either use five Ni-Cd cells or four dry cells. A charger circuit is not included here as a host of charger circuits have appeared in EFY on and off. However, you may use a standard bridge rectifier with 7806 as regulator for the power supply and charger.

Pressing the reset button momentarily pulls all the internal counters of CD4060 to zero and the timer starts again. The timer is reliable, accurate, and consumes about 10 mA of current when the buzzer is active.

Piezo-electric buzzers are reliable, rugged, and serve as cheap audio alarms. They are available for operation in continuous and intermittent modes, and also with musical notes. However, if you ever require louder sound, say for a classroom, then you have an optional 555 circuit wired up as an astable multivibrator. This can be brought into operation by shorting points x-x in the circuit.