In the circuit of Fig.1, find the peak value of $V_o$ and the minimum value in $V_o$. The diode drops 0.6 V when it conducts.

$V_{o_{MAX}} = 30 - 0.6 = 29.4V$

$\Delta V_o = IcP/C = \frac{10^{-3}}{60} = 1.67V$

$V_{o_{MIN}} = 29.4 - 1.67 = 27.73$

Determine the gain of the amplifier in Fig.2 and choose $R_1$ so that the amplifier is optimally biased for sinusoidal operation. The transistor base to emitter voltage is 0.6 V.

$A = \frac{-10K}{2K} = -5$

$V_E = \frac{2}{12}6 = 1V$

$V_B = 1.6V$

$R_1 = \left[\frac{1.6}{12-1.6}\right]200K = 30.7K$

Figure 3 is the schematic of an oscillator. The oscillator is (A) a Colpitts oscillator or, (B) a Hartley. Choose (A) or (B).

A [ ]

B [X]

Determine the frequency of the oscillator in Hz if the reactive elements are lossless.

$\Omega^2 = \frac{1}{(2E-12)} \quad \Omega = 0.707E6$

$F_o = \frac{7.07E5}{2\pi} = 1.13E5$