[07 – 2216]

II/IV B.Tech. DEGREE EXAMINATION.

Second Semester

Computer Science and Engineering

ELECTRONICS – II

(Common with Information Technology)

(Effective from the admitted batch of 2006–2007)

Time : Three hours Maximum : 70 marks

Question No. 1 is compulsory.

Answer any FOUR from the remaining.

All questions carry equal marks.

Answer all parts of any question at One place.

1. (a) Describe how noise reduction is achieved using feedback.
   (b) Draw the equivalent circuit of trans conductance amplifier.
   (c) Draw the equivalent circuit of piezoelectric crystal.
   (d) Define CMRR of an op-amp.
   (e) Give the Ideal characteristics of an op-amp.
   (f) What are the factors which affect the frequency stability of oscillations?
   (g) What is the other name of Astable multivibrator? Why is it called so?

7. (a) An inverting amplifier using 741 IC must have a flat response upto 40 KHz. The gain of the amplifier is 20. What maximum peak to peak input signal can be applied without distorting the output?

(b) Write a note on the use of an Op-Amp as an integrator and a differentiator.

8. (a) What is bi-stable circuit? Discuss the operation of a transistor bistable multivibrator with output waveforms.

(b) Design an astable multivibrator for output amplitude of 15 V and square wave of 500 Hz. Use silicon transistors having $(h_{fe})\text{min} = 50$, $(I_C)_{sat} = 5\,\text{mA}$ $(V_{CE})_{sat} = 0.2\ \text{V}$.

2. (a) Explain current shunt feedback with neat circuit diagram.

(b) The circuit shown in figure 1 has the following parameters $R_C = 4\ k\Omega$, $R' = 40\ k\Omega$, $R_S = 10\ k\Omega$, $h_{ie} = 1.1\ k\Omega$, $h_{fe} = 50$ and $h_{re} = h_{oc} = 0$.

Find : (i) ${}^{A}V_F$ (ii) R_{if} (iii) R^1_{of}

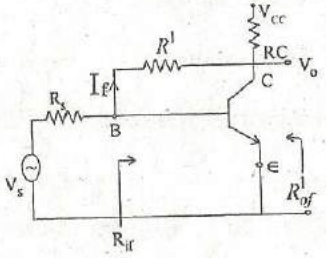

Figure 1

3. (a) Explain different characteristics of negative feedback amplifier.

(b) Figure 2 shows a feedback circuit of the shunt - series type. Find I_{out}/I_{in}, R_{out}. Assume transistor to have $\beta = 100$ and $VA = 75V$.

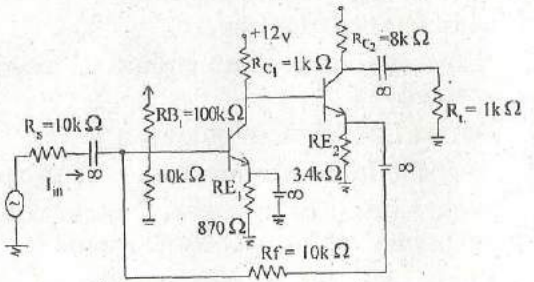

Figure 2

4. (a) Draw and explain Wein bridge oscillator and also explain how amplitude stabilization achieved.

(b) With neat circuit diagram, show that for the hartley oscillator, the frequency of oscillations is given by $\omega_0 = \frac{1}{\sqrt{(L_1 + L_2)c}}$ and that for oscillation to start $g_m R > L_1/L_2$.

5. (a) Draw Tuned collector oscillator and explain its working and also derive expression for frequency of oscillation.

(b) A crystal oscillator has the following parameters L = 0.5 H, C = 0.06 PF, Cm = 1PF and R = 5 kΩ. Find the series and parallel resonant frequencies and Q-factor of the crystal.

6. (a) Explain about different Op-Amp parameters.

(b) Obtain the voltage gain V_o/V_i for the circuit shown figure 3.

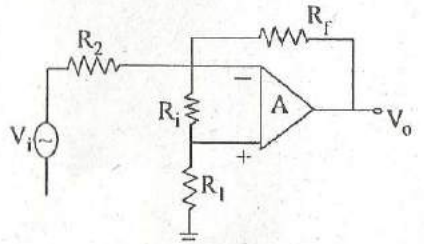

Figure 3