T.E | EXTC | SEM V | R.E.V. | May 2005
Communication Circuits

Con/2135-05. (REVISED COURSE) AM-6952

(3 Hours) [Total Marks : 100

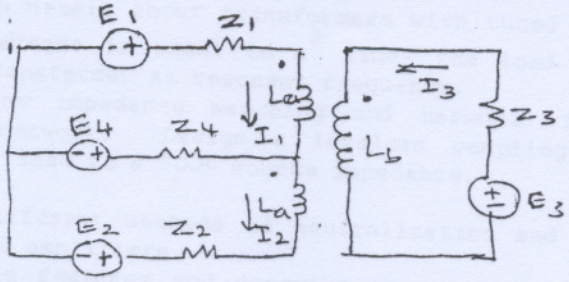
N.B. (1) Q. No. 1 is compulsory.
(2) Attempt any four out of remaining six questions.
(3) Assumptions made should be clearly stated.
(4) Assume suitable data if required, but justify the same.
(4) Figures to the right indicate full marks.

1. Answer any four :- 20
(a) What minimum input signal will give an output signal-to-noise ratio of 0 dB in a system that has an input impedence equal to 50 Ω a noise figure of 8 dB and bandwidth of 2.1 kHz.
(b) Describe LM 380 as phono-amplifier.
(c) Explain the operation of Dual-D flipflop phase detector with a neat diagram.
(d) With a neat diagram, explain the operation of direct frequency synthesizer.
(e) Explain the method of impedence matching using reactive networks over a narrow frequency range.

2. (a) Describe the noise that occurs in active devices. 8
(b) Explain the characteristics of RCA 3040 video amplifier with a neat circuit diagram. 12

3. (a) Discuss in detail the analysis of series RLC circuit with pole-ze diagram. 10
(b) Derive the expressions for resistance and capacitance of a capactive transformer and show that the turns ratio is $(1 + \frac{C_1}{C_2})$ 10

4. (a) For a circuit shown below. Derive the expressions for Z_3 and Z_4. 10



(b) Derive an expressions for power transfer and phase distribution in case of a hybrid transformer. 10

5. (a) With a neat diagram. Explain the basic operation of PLL. Explain about capture and lock range. 8
(b) Write short notes on :- 12
(i) Frequency demodulation using PLL.
(ii) PLL as amplitude demodulator.

6. (a) Explain frequency synthesis by phase lock method and compare its advantages over direct frequency synthesizer. 12
(b) Design a direct digital frequency synthesizer to generate 15.2×10^6 Hz from 1×10^6 Hz reference oscillator. 8

7. (a) Derive the expression for output voltage for a two diode switching type miner. 8
(b) Write short notes on :- 12
(i) FET Mixer.
(ii) AM modulator using 1596.