T.E. Sem. V (REV) – EXTC. NOV'2006 – Communications circuits

Con. 5249-06. YM-6754

(REVISED COURSE)

(3 Hours) [Total Marks : 100

N.B. (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.

1. Answer the following questions (any **four**) :— 20
   (a) Describe LM 380 as phono-amplifier.
   (b) With a neat diagram, explain the operation of direct frequency synthesizer.
   (c) Explain the method of impedance matching using reactive networks over a narrow frequency range.
   (d) Explain FET-Mixer with neat diagram.
   (e) Which are the general features of audio amplifiers ?

2. (a) With a neat block diagram, explain the basic operation of PLL and derive the expression for transfer function of Second Order PLL. 10
   (b) Explain the following PLL applications : 10
   (i) Amplitude demodulation (ii) Signal synchronizers and carrier recovery.

3. (a) Explain in detail the analysis of the series RLC circuit and suggest any one application of it. 10
   (b) Explain different methods of neutralization and feedback techniques used in wideband amplifiers. 10

4. (a) Derive the expresions for resistance and capacitance of a capacitive transformer and show that the turns ratio is $\left(1+\frac{C_1}{C_2}\right)$. 10
   (b) Explain the characteristics of RCA 3040 Video-amplifier with a neat circuit diagram. 10

5. (a) What is DDFS ? With a neat block diagram explain its operation. 10
   (b) Explain frequency synthesizer by phase lock method and bring out its advantages as compared with direct frequency synthesizer. 10

6. (a) Design a lossless coupling network that matches a load of (12 + j5) Ω to a 40 Ω source impedance at 20 MHz. 10
   (b) What is hybrid transformer ? Explain the power transfer in such transformer. 10

7. (a) Design a direct digital frequency synthesizer to generate $15{\cdot}8 \times 10^6$ Hz from a 1×10^6 Hz reference oscillator. 10
   (b) Drive an expression for output voltgage of a double balanced mixer. 10
