

(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.
 (3) Draw **suitable** diagrams wherever **necessary**.

1. Answer the following questions (any **four**) :— 20
 - (a) Describe LM 380 as phono-amplifier.
 - (b) What is broadbanding ? Explain any one method.
 - (c) What is noise and list different sources of noise in communication circuits ?
 - (d) Explain FET Mixer with neat diagram.
 - (e) Explain the method of impedance matching using reactive networks over a narrow frequency range.

2. (a) Explain Noise in active devices. 10
 (b) What is intermodulation distortion ? Discuss in detail about different parameters that are related with intermodulation distortion. 10

3. (a) Explain the characteristics of IC 3040 Video-amplifier with circuit diagram. 10
 (b) Discuss in detail the analysis of series RLC circuit with pole-zero diagram. 10

4. (a) With a neat diagram, explain the basic operation of PLL. Explain about capture and lock range. 10
 (b) Write short notes on :— 10
 - (i) Frequency demodulation using PLL
 - (ii) PLL as amplitude demodulator.

5. (a) Derive the expressions for resistance and capacitance of a capacitive transformer 10
 and show that the turn ratio is $\left[1 + \frac{C_1}{C_2} \right]$.
 (b) Explain different methods of neutralization and feedback techniques used in wideband amplifiers. 10

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

7. (a) What is DDFS ? With a neat diagram explain its operation. 10
 (b) Derive an expression for output voltage of a double balanced mixer. Justify how it is better than other switching type mixers. 10