

SIXTH SEMESTER B.TECH DEGREE EXAMINATION

13.605 ANALOG AND DIGITAL COMMUNICATION (A)

Time: 3 Hours

Max. Marks : 100

PART - A

(Answer all questions. Each question carries 4 marks.)

1. What is Aliasing? Choose minimum sampling frequency to prevent aliasing when transmitted signal is $f(t)=120 \sin (2 \times 3.14 \times 1000t)$
2. Calculate modulation in AM if carrier signal $10 \sin(10000t)$ is modulated simultaneously by $2\sin(100t)$ and $3\sin(200t)$
3. Find FM bandwidth required for transmission if maximum modulating signal frequency and frequency deviation are 20 KHz and 75 MHz
4. Mention properties of matched filter?
5. Explain how PN sequences are generated.

PART - B

(Answer any one question from each Module.)

Module - I

6.
 - a. Deduce power relations between carrier and sidebands in AM (12 Marks)
 - b. What is image frequency rejection ratio (IFRR) of a super heterodyne receiver. Write expression for IFRR and explain (8 Marks)
7.
 - a. Draw the block schematic of a super heterodyne receiver. Explain each block in detail (10marks)
 - b. What are the different methods of SSB generation. Explain the phase shift method SSB generation in detail (10 Marks)

Module - II

- 8.
- a. Deduce an expression for a FM wave. Explain the principle of FM generation using a FET based reactance modulator. (8 Marks)
 - b. Explain the working of a Foster- Seeley discriminator. (8 Marks)
 - c. What is pre-emphasis and de-emphasis in FM (4 Marks)
- 9.
- a. Sketch the block a schematic of a typical FM transmitter and explain (10 Marks)
 - b. Compare AM and FM systems. (5 Marks)
 - c. Explain the working of a ratio detector. (5 Marks)

Module - III

- 10.
- a. Distinguish between PCM and DPCM. Sketch a block schematic of a PCM transmitter and Explain each block in detail (10 Marks)
 - b. What is slope overloading in DM. Deduce a condition to prevent this in DM. Also explain how slope overloading prevented in ADM. (10 Marks)
- 11.
- a. The binary data stream 011100101 is applied to the input of a modified duo binary coder output and corresponding receiver output .
 - i. Without a precoder
 - ii. With a precoder in transmitter (12 Marks)
 - b. Explain briefly baseband M-ary PAM transmission . (8 Marks)

Module - IV

- 12.
- a. What are diversity techniques. Explain how are they implemented in time frequency and space. (10 Marks)
 - b. Discuss on Rake receiver in CDMA. (10 Marks)
- 13.
- a. Write a note on Pseudo-Noise sequences (10 Marks)
 - b. Explain the different types of multiple access techniques (10 Marks)