Total number of printed pages = 4

19/6th Sem/UIE 612

2022

COMMUNICATION ENGINEERING

Full Marks – 100

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer any *five* questions.

1. (a) What is modulation ? Explain the importance of modulation. 1+3=4

   (b) Explain the block diagram of the wireless communication system. 4

   (c) Explain the role of Fourier Transform with the help of an example. 6

   (d) Explain the frequency domain representation of AM wave. 6

2. (a) Explain Square Law diode modulation and obtain an expression for its output. 8

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(b) Find the total power content of AM wave. 6

(c) Explain the Envelope detector and draw the characteristics of the linear diode detector and detected output. 4

(d) Explain the importance of the DSB-SC signal. 2

3. (a) With the help of a balanced modulator explain the generation of the DSB-SC signal. 7

(b) Explain the phase shift method to generate the SSB-SC signal. 7

(c) Give the limitation of the frequency discrimination method. 3

(d) Draw the spectrum of DSB-SC and SSB-SC. 3

4 (a) What is the difference between FM and PM signals ? 4

(b) Derive the general expression of FM modulation. 6

(c) Derive the expression of Narrowband FM and draw its spectrum. 10

5. (a) With the help of a neat block diagram explain the Superheterodyne receiver. 7

(b) Write the limitations of tuned radio frequency. 3

(c) Explain how sample and hold circuit can be used to generate PAM signals. 6

(d) Explain demodulation of PAM signal. 4

6. (a) What is Quantizer ? Differentiate between a uniform and a non-uniform quantizer. 4

(b) Derive the expression for signal to noise quantization for linear quantization. 8

(c) Draw the following data formats for the bit stream 1100110 : 3

(i) Unipolar RZ

(ii) AMI

(iii) Manchester.

(d) Explain the operation of Delta Modulation. 5

7. Write short notes on any *four* of the following : 5×4=20

(i) VSB

(ii) Ring Modulator

(iii) FM Demodulator

(iv) Direct Method of FM generation

(v) TDM

(vi) ASK.