

27 May, 2011.

Sem - V (R) Bio-Medical
Principles of Analog & Digital Communication

P4-Exam.-May-11-99

Con. 3008-11.

RK-2115

(3 Hours)

[Total Marks : 100

- N.B. :** (1) Question No. 1 is **compulsory**.
(2) Answer any **four** questions out of remaining **six** questions.
(3) **Figures** to the right indicate **full** marks.
(4) Assume **suitable** data wherever **necessary**.

1. (a) Explain double spotting. (5)
(b) Explain aliasing effect. (5)
(c) Explain Noise triangle. (5)
(d) State and explain sampling theorem. (5)
 2. (a) An AM transmitter supplies a 15 KW of carrier power to 100 Ω load. (10)
It is 70% modulated by 5 KHz sinewave. The carrier frequency is 2 MHz.
(i) Sketch the frequency spectrum.
(ii) Calculate total average power.
(iii) Calculate RMS voltage of the AM signal.
(iv) Calculate peak voltage of the AM signal.
(b) Explain with block diagram and waveforms, working of Super-heterodyne receiver. (10)
Give advantages.
 3. (a) Write a brief note on indirect method of FM generation with block diagram. (10)
(b) Draw and explain quadrature detector with block diagram and advantages. (10)
What is capture effect?
 4. (a) Explain PWM modulation using ramp and pedestal generator with waveforms. (10)
(b) Explain block diagram of PCM and quantization process in detail. (10)
 5. (a) Explain generation and detection of FSK in detail. (10)
(b) What are the advantages of multiplexing technique? Explain FDM in detail. (10)
 6. (a) What is the need of AGC? Explain different types of AGC. (10)
(b) Compare DM and ADM with the block diagrams. (10)
 7. Write short notes on (**any four**) of the following: (20)
(a) Companding
(b) Phase shift method of SSB generation
(c) Characteristics of AM receiver
(d) PCM - TDM system
(e) Simple diode detector
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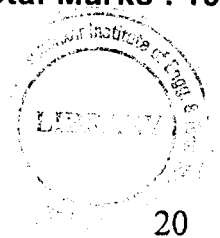
Bio medical V (Rev)
Principles of Analog and Digital
(REVISED COURSE)
Communication
(3 Hours)

29/11/2010.

GT-6735

Total Marks : 100

- N.B. :** (1) Question No.1 is **compulsory**.
 (2) Attempt any **four** questions out of remaining **six** questions.
 (3) **Figures to the right indicate full marks.**



1. Answer any Four of the following questions:- 20
- (a) Explain various types of noises in communication system.
 - (b) Compare low level modulation and high level modulation.
 - (c) Explain noise triangle in FM
 - (d) Compare PAM, PWM & PPM.
 - (e) What is sampling theorem? Explain various methods of sampling.
2. (a) Explain grid modulation with circuit diagram and waveforms. 08
 (b) A carrier wave $V_c = 15 \sin(2\pi \times 25 \times 10^3 t)$ is amplitude modulated by 12
 an audio signal $V_m = 8 \sin(2\pi \times 3 \times 10^3 t)$. Modulated voltage is developed across a 50 ohm load.
 i. Write the expression for the modulated wave.
 Determine the modulation index.
 ii. Draw AM waveform & its frequency spectrum.
 iii. Calculate the total power and the sideband power.
 How much power is saved if SSBSC is generated?
3. (a) What is angle modulation? Derive the expression for FM. 10
 (b) Explain any one method of generation of FM. 10
4. (a) With a neat block diagram explain the working of super heterodyne receiver. 10
 (b) Explain phase shift method of SSB generation. 10
5. (a) Draw the block diagram of Delta Modulator and explain. 12
 What are its drawbacks? How do you overcome them?
 (b) Explain the following:- 08
 i. Quantization ii. Companding
6. (a) Draw the block diagram of BPSK transmitter, receiver and explain 12
 (b) Explain PCM TDM system in detail. 08
7. Write short note on any **Four**. 20
- (a) Receiver characteristics
 - (b) Ring modulator
 - (c) Compare Narrowband FM and wideband FM
 - (d) Noise factor of amplifiers in cascade
 - (e) AM demodulation

PRINCIPLES OF ANALOG AND DIGI. COMM.

VT-April-10- 134

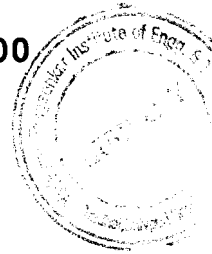
Con. 3518-10.

(REVISED COURSE)

AN-4252

(3 Hours)

[Total Marks : 100



- N.B. :** (1) Question No. 1 is **compulsory**.
 (2) Attempt any **four** questions out of remaining **six** questions.
 (3) Assume **suitable data** if required.

1. Answer the following any **four** :- **20**
 - (a) Explain Noise triangle
 - (b) Compare AM with FM
 - (c) Delayed AGC and simple AGC
 - (d) Sampling theorem and aliasing effect
 - (e) List advantage of digital modulation.

2. (a) Explain balance modulator using JFET with mathematical analysis. **10**
 (b) Explain adaptive delta modulation technique compare it with delta modulator. **10**

3. (a) Explain indirect method of FM generation with phasor diagram. **10**
 (b) Explain filter method of SSB generation. **10**

4. (a) An AM transmitter supplies a 10 kW of carrier power to a 50Ω load. **10**
 It operates on carrier frequency of 1.2 MHz and it is 80% modulated by a 3 KHz sinewave.
 - (i) Sketch the signal in frequency domain with frequency and power scale. Show the power in dBW.
 - (ii) Calculate total average power in the signal in watt and dBW.
 - (iii) Calculate RMS voltage of the signal
 - (iv) Calculate peak voltage of the signal.
- (b) Explain working of superhetrodyne receiver with waveform at each stage. **10**

5. (a) Explain PWM demodulation using ramp and pedestal generator with proper waveform. **10**
 (b) When modulating frequency in FM system is 400 Hz and the modulating voltage is 2.4 V the modulation index is 60. Calculate maximum deviation. What is modulation index when modulating frequency is reduced to 250 Hz and modulating voltage is increases to 3.2 V ? **10**

6. (a) Explain block diagram of PCM and explain quantization process in detail. **10**
 (b) What is Pre-emphasis and De-emphasis circuit in detail ? **10**

7. Write short notes on any **four** :- **20**
 - (a) Different Sources of Noise
 - (b) Compare TDM and FDM
 - (c) VSB
 - (d) Compare BASK, BFSK and BPSK
 - (e) Companding Technique.

Con. 5394-09.

SP-8594

(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) **Figures to right** indicates **full marks**.

1. Write short notes on any **four** of the following :—

- Types of Electronic Communication system.
- Need of modulation.
- Noise Triangle.
- Sampling Theorem for band pass signals.
- Multiple access techniques.



20

- Derive an expression for AM. Hence plot the frequency spectrum. 8
 - A modulating signal $20 \sin(2\pi \times 10^3 t)$ is used to modulate a carrier signal $40 \sin(2\pi \times 10^5 t)$. Find the modulation index, sideband components and bandwidth. 8
 - For 100% modulation, find out the transmission efficiency. 4
- What are the different methods of generating AM? Explain any one in detail. 10
 - Explain the working of balanced modulator for DSBSC generation. 10
- Explain the characteristics of a radio receiver in detail. 10
 - Draw a neat block diagram of super heterodyne receiver with waveforms at each stage and explain the working. 10
- Explain the working of Foster Seeley discriminator. What is the drawback? How it is overcome in Ratio detector? 10
 - What do you mean by indirect method of FM generation? Explain Armstrong method of FM generation. 10
- Give a transistorized circuit for PWM generation. How do we get PPM from PWM? 10
 - Discuss the working of PCM system with a neat block diagram. 10
- For a digital data 1101100101, if $f_b = 1$ KHz and $f_c = 2$ KHz. Draw BASK, BPSK and BFSK waveforms. 10
 - What are the advantages of multiplexing techniques? Explain FDM in detail. 10