



IV-SEM / E & TC / 2018 (W) [19/12/2018, EX-REG]
COMMUNICATION ENGINEERING - I

Sub Code – **ETT-403**

Full Marks: 70

Time: 3 Hours

Answer any **FIVE** Questions

The figures in the right-hand margin indicate marks

1. (a) Define modulation index of AM and give its advantages. [2]
(b) Explain the operation of envelope detector with a neat block diagram. [5]
(c) Describe the operation and working principles of Balanced Modulation with neat diagram. [7]
2. (a) What is DSB-SC signal? [2]
(b) Derive the Power relation in AM Wave. [5]
(c) With neat diagram explain the operation of super heterodyne receiver. [7]
3. (a) Write down the definition of multiplexing. [2]
(b) Draw the proper diagram and explain the FM stereophonic Receiver. [5]
(c) Describe the generation and detection of a PPM signal. [7]
4. (a) Define Nyquist Rate. [2]
(b) Discuss the demodulation process of PWM signal. [5]
(c) What is PAM? Explain the generations of PAM signal. [7]
5. (a) Define selectivity and sensitivity. [2]
(b) Explain one of the method of SSB-SC generation. [5]
(c) Discuss the generation of Delta Modulation with a neat block diagram. [7]
6. (a) What is MODEM? [2]
(b) Discuss the block diagram of FM Receiver. [5]
(c) Give the brief description of PCM Transmitter and Transmission Path. [7]
7. (a) Define channel capacity. [2]
(b) Explain demodulation of QPSK Signal with proper receiver diagram. [5]
(c) Describe the generation and demodulation of ASK with Proper diagram. [7]

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Collected By:-
Er. Paramananda Gouda
(Dept. of ETC, UCP Engg School)



IV-SEM / E & TC / 2018(S) [12-05-2018, REG]

COMMUNICATION ENGINEERING - I

Sub Code – **ETT-403**

Full Marks: 70

Time: 3 Hours

Answer any **FIVE** Questions

The figures in the right-hand margin indicate marks

1. (a) What is sampling theorem? [2]
(b) Explain quantization of signal and quantization error. [5]
(c) With proper block diagram, define & explain the elements of communication system. [7]
2. (a) Define modulation index for Frequency Modulation (FM). [2]
(b) Derive the expression for AM wave and calculate the power content in AM wave. [5]
(c) State the working of Superhetrodyne receiver with block diagram. [7]
3. (a) Define Selectivity of a receiver. [2]
(b) Compare between AM and FM. [5]
(c) Discuss the generation of QPSK with a neat circuit diagram. [7]
4. (a) Define Spread Spectrum. [2]
(b) Define the following terms: - (i) BIT (ii) BAUD (iii) Symbols (iv) Channel Capacity. [5]
(c) Derive the expression for Frequency Modulation (FM) signal and explain how we can Generate FM by using PM. [7]
5. (a) Define analog and digital signal. [2]
(b) State the advantages of digital communication system. [5]
(c) Explain ring modulator method of generation of DSB-SC signal with neat diagram. [7]
6. (a) What are the generating methods for SSB-SC Signal? [2]
(b) Explain Linear Diode detector method of AM demodulator with neat block diagram. [5]
(c) Explain about adaptive delta modulation and its advantages over delta modulation. [7]
7. (a) What is PAM? [2]
(b) What is time division multiplexing? Explain the operation of TDM. [5]
(c) Explain the working of T-Carrier System with a neat diagram. [7]

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Collected By:-

Er. Paramananda Gouda
(Dept. of ETC, VCP Engg School)



[26/12/2017, BACK]

IV-SEM / E & TC / 2017(W)
COMMUNICATION ENGINEERING - I

Sub Code – ETT-403

Full Marks: 70

Time: 3 Hours

Answer any **FIVE** Questions

The figures in the right-hand margin indicate marks

1. (a) Define Channel Bandwidth (B.W.) [2]
(b) State and explain square law detector with a neat circuit diagram. [5]
(c) State the method of generation and detection of DSB-SC signal with neat block diagram. [7]
2. (a) Define Frequency Division Multiplexing (FDM). [2]
(b) Derive the expression for Frequency Modulated Signal and find modulation Index. [5]
(c) Explain the principle of operation of FM demodulation using Foster Seely Discriminator with a neat block diagram [7]
3. (a) Define PLL. [2]
(b) State and explain SSB Signal and DSB-SC Signal. [5]
(c) Discuss FM Generation using Armstrong method with a neat block diagram. [7]
4. (a) Define Fidelity and Noise Figure of a receiver. [2]
(b) Explain the working of Stereophonic FM Receiver with block diagram. [5]
(c) State the working of Superhetrodyne radio receiver with block diagram. [7]
5. (a) State and explain Nyquist rate and aliasing in PCM. [2]
(b) Discuss the generation and detection of PWM Signal. [5]
(c) Explain the generation and demodulation of PCM Signal. [7]
6. (a) State Quantization Error. [2]
(b) Define Companding in PCM and vocoder. [5]
(c) Explain the generation and demodulation of Adaptive Delta Modulation. [7]
7. (a) Define Spread Spectrum and its application. [2]
(b) Explain operation of Spread Spectrum modulation techniques (DS-SS and FH-SS). [5]
(c) Discuss the generation and detection of binary DPSK and QPSK Signal. [7]

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Collected By:-

Er. Paramananda Gouda
(Dept. of ETC, UCP Engg School)



IV-SEM / E & TC / 2017(S) [APR-2017, REG]

COMMUNICATION ENGINEERING - I

Sub Code – **ETT-403**

Full Marks: 70

Time: 3 Hours

Answer any **FIVE** Questions

The figures in the right-hand margin indicate marks

1. (a) Define Analog and Digital Signals. [2]
(b) With its neat block diagram explain the Balanced Modulator of DSB-SC generation. [5]
(c) Describe the operation of Linear Diode detector. [7]
2. (a) What is modulation Index of AM Signal and Give its importance? [2]
(b) State Multiplexing. Explain operation of Frequency Division Multiplexing. [5]
(c) Describe the parameter variation method of FM generation. [7]
3. (a) Define Selectivity and sensitivity of receiver. [2]
(b) State the working of FM receiver with Block diagram. [5]
(c) Explain the principle of operation of FM Forster-seely Discriminator Demodulator. [7]
4. (a) What is DSB-SC? [2]
(b) Explain the working of Stereophonic FM Receiver. [5]
(c) State the working of Superhetrodyne radio receiver with block diagram. [7]
5. (a) State Sampling Theorem and classify Sampling. [2]
(b) Discuss the comparison between AM and FM Modulation. [5]
(c) Describe the generation and detection of PAM. [7]
6. (a) State Shannon Theorems. [2]
(b) Classify digital modulation Techniques. [5]
(c) Describe the generation of Delta Modulator. [7]
7. (a) Define Aliasing. [2]
(b) Explain the working of T-Carrier System. [5]
(c) Describe the generation of PCM System. [7]

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Collected By:-

*Er. Paramananda Gouda
(Dept. of ETC, UCP Engg. School)*



IV-SEM / E & TC / 2016(S) <APR-2016, REG>

COMMUNICATION ENGINEERING - I

Sub Code – ETT-403

Full Marks: 70

Time: 3 Hours

Answer any **FIVE** Questions

The figures in the right-hand margin indicate marks

1. (a) Define Analog and Digital signal. [2]
(b) Discuss concept of Multiplexing & explain operation of Frequency Division Multiplexing.
(c) Describe the operation of Envelop detector with a neat diagram. [7]
2. (a) What is Modulation Index of AM? [2]
(b) Derive the power relation in AM wave. [5]
(c) With a neat diagram explain the working of ring modulation. [7]
3. (a) Write down the disadvantages of Delta Modulation. [2]
(b) Explain the working principle of FM stereophonic Transmitter. [5]
(c) Describe the principle of operation of Forest-Seeley discriminator. [7]
4. (a) Define the term Selectivity. [2]
(b) Discuss each block of FM receiver with a neat diagram. [5]
(c) With proper diagram describe the operation of super heterodyne Receiver. [7]
5. (a) What is Modulation? [2]
(b) Explain the operation of the Direct Method of Frequency Modulation. [5]
(c) Describe the working of PCM Modulation and PCM Demodulation. [7]
6. (a) What is Repeater and why it is essential? [2]
(b) Discuss the term given below: [5]
(I) Sampling (II) Nyquist rate (III) Nyquist Interval (IV) Aliasing
(c) Describe the operation of PAM Modulation. [7]
7. (a) State the difference between envelope and square law detector. [2]
(b) Explain the worker of PWM communication system. [5]
(c) Describe the operation of ASK Modulation and Demodulation. [7]

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Collected By:-

*Er. Paramananda Gouda
(Dept. of ETC, UCP Engg School)*



IV-SEM / E & TC / 2015(S) <APR-2015, REG>

COMMUNICATION ENGINEERING - I

Sub Code – ETT-403

Full Marks: 70

Time: 3 Hours

Answer any **FIVE** Questions

The figures in the right-hand margin indicate marks

1. (a) Define analog and digital signals. [2]
(b) Explain the Balanced Modulator with its diagram. [5]
(c) Describe the operation of linear diode detector for AM demodulation with neat diagram. [7]
2. (a) What is Channel Bandwidth? [2]
(b) Define Multiplexing. Explain operation of Frequency Division Multiplexing. [5]
(c) With neat diagram describe the principle of operation of FM Foster-Seeley Discriminator. [7]
3. (a) What is selectivity of Receiver? [2]
(b) State the working of FM receiver with block diagram. [5]
(c) Describe the working of super heterodyne radio receiver with block diagram. [7]
4. (a) State sampling theorem and classify sampling. [2]
(b) Explain the generation process of ASK and demodulation of ASK. [5]
(c) Describe the generation and detection of PAM communication system. [7]
5. (a) What is DSB-SC? [2]
(b) Discuss the Comparison between AM and FM Modulation. [5]
(c) Properly describe the operation of Stereophonic FM Receiver. [7]
6. (a) State Shannon's Theorem. [2]
(b) Explain the one of the SSB-SC Modulation or Generation Method. [5]
(c) Describe the generation of Delta Modulator. [7]
7. (a) Name the disadvantages of Delta Modulation. [2]
(b) With neat diagram explain the working of T1 carrier System. [5]
(c) Explain operation of Spread Spectrum modulation technique (DS-SS) with neat diagram. [7]

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Collected By:-

*Er. Paramananda Gouda
(Dept. of ETC, UCP Engg School)*



IV-SEM / E & TC / 2014(S) <APR-2014, REG>

COMMUNICATION ENGINEERING - I

Sub Code – **ETT-403**

Full Marks: 70

Time: 3 Hours

Answer any **FIVE** Questions

The figures in the right-hand margin indicate marks

1. (a) What are the classifications of communication systems? [2]
(b) State and explain amplitude modulation and derive the expression for amplitude modulation Signal power relation. [6]
(c) State and explain the generating and detection of SSB signal using any one of method. [8]
2. (a) Define power channel band width. [2]
(b) Discuss the concept of multiplexing and explain the operation of frequency division multiplexing with a neat diagram. [5]
(c) Explain the methods of generation DSB-SC signal {Ring modulator} with neat circuit diagram and draw the DSB-SC signal waveform. [8]
3. (a) Define frequency modulation and modulation. [2]
(b) Define phase modulation and compare the AM and FM modulation. [6]
(c) Explain the working principle of FM stereophonic transmission with neat block diagram. [8]
4. (a) Define the principle of heterodyne. [2]
(b) Draw the block diagram of FM receiver and explain the working of each block.
(c) Explain the principle of operation of Foster Seeley detector using a neat circuit diagram and Draw its phase relations. [8]
5. (a) Define noise figure. [2]
(b) State and explain Sampling theorem and Nyquist rate. [6]
(c) Explain the working of T-carrier system with a neat diagram. [8]
6. (a) What is modem and give its applications. [2]
(b) Explain the generation and demodulation of delta modulation system. [6]
(c) What is spread techniques & explain direct sequence spread spectrum method with diagram.
7. (a) Define Shannon Theorem. [2]
(b) Explain method of generation & detection of DPSK technique with neat block diagram. [6]
(c) Explain the Gaussian minimum shift keying (GMSK) digital communication technique. [8]



IV-SEM / E & TC / 2013(S) <APR-2013, REG>

COMMUNICATION ENGINEERING - I

Sub Code – ETT-403

Full Marks: 70

Time: 3 Hours

Answer any FIVE Questions

The figures in the right-hand margin indicate marks

1. (a) Define source of information. [2]
(b) Define analog and digital signal and communication channels. [6]
(c) State and explain the working of square law AM detector with a neat circuit diagram. [8]
2. (a) Define percentage of modulation. [2]
(b) State and explain SSB signal and DSBSC signal. [6]
(c) State and explain amplitude modulation and derive the expression for AM signal, power relation in AM wave and find modulation index. [8]
3. (a) Define modulation index for FM and what is its important. [2]
(b) Explain Armstrong method for FM generation with neat circuit diagram. [6]
(c) Explain the working of FM stereophonic FM transmitter with a neat block diagram. [8]
4. (a) What is alignment of radio receiver? [2]
(b) State and explain the terms Selectivity, Sensitivity and Fidelity. [6]
(c) Explain the Working of FM Receiver With a block diagram. [8]
5. (a) Define Nyquist rate. [2]
(b) Explain the working off-carrier system. [6]
(c) Explain the generation and demodulation of Adaptive Delta Modulation method. [8]
6. (a) What is PLL? [2]
(b) Explain method for generation & Detection for QPSK Digital Communication System. [6]
(c) What is spread spectrum and explain the operation of DS-SS-modulation techniques? [8]
7. (a) What is Modem, and. where it is used? [2]
(b) State the advantages and disadvantages of Digital Communication System. [6]
(c) Explain generation and demodulation of PCM. [8]

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Collected By:-

*Er. Paramananda Gouda
(Dept. of ETC, UCP Engg School)*



IV-SEM / E & TC / 2012(S) <APR-2012, REG>

COMMUNICATION ENGINEERING - I

Sub Code – ETT-403

Full Marks: 70

Time: 3 Hours

Answer any **FIVE** Questions including Q. No. 1 and 2
The figures in the right-hand margin indicate marks

1. Answer **ALL** question: [2x10]
- (a) What are the sources of information?
 - (b) What are the advantages of SSB over DSB?
 - (c) Why AM is useful?
 - (d) Define Multiplexing.
 - (e) What do you mean by frequency deviation in frequency modulation?
 - (f) Define noise figure and state its significance.
 - (g) What is the difference between sampling and Quantization?
 - (h) Write any two advantages of digital communication over analog communication.
 - (i) What is quadrature modulation?
 - (j) Name the components of PLL.
2. Answer any **SIX** question of the following: [6 X 5]
- (a) Explain the operation of balanced modulator.
 - (b) Derive the expression for frequency modulated signal.
 - (c) Explain the operation of Armstrong FM transmitter.
 - (d) Explain the working of T-carrier system.
 - (e) Explain the concept of delta modulation.
 - (f) Explain briefly about PSK technique.
 - (g) Define modem and state its application.
 - (h) Explain the principle of working of SSB system.
3. State & explain AM and derive expression for AM & find signal power relation of AM wave. [10]
4. Describe working of Foster-Seely discriminator FM demodulation method with neat diagram. [10]
5. Draw the block diagram of a Superhetrodyne receiver and explain function of each block. [10]
6. Explain the principle of operation of PCM encoder and decoder using block diagram. [10]
7. Explain the operation of direct sequence spread spectrum modulation technique. [10]

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Collected By:-

*Er. Paramananda Gouda
(Dept. of ETC, UCP Engg School)*



UCP Engineering School

Fb/Discover Brahmapur

