A-005-005-005 **(D)**

When the transmitter is not modulated, or the amplitude of the modulating signal is zero, the frequency of the carrier is called its:

A   frequency deviation

B   frequency shift

C   modulating frequency

D   centre frequency

A-005-005-006 **(C)**

In an FM transmitter system, the amount of deviation from the centre frequency is determined solely by the:

A   amplitude and the frequency of the modulating frequency

B   modulating frequency and the amplitude of the centre frequency

C   amplitude of the modulating frequency

D   frequency of the modulating frequency

A-005-005-007 **(C)**

Any FM wave with single-tone modulation has:

A   four sideband frequencies

B   one sideband frequency

C   an infinite number of sideband frequencies

D   two sideband frequencies

A-005-005-008 **(A)**

Some types of deviation meters work on the principle of:

A   a carrier null and multiplying the modulation frequency by the modulation index

B   detecting the frequencies in the sidebands

C   the amplitude of power in the sidebands

D   a carrier peak and dividing by the modulation index

A-005-005-009 **(D)**

When using some deviation meters, it is important to know:

A   modulation index

B   modulating frequency

C   pass-band of the IF filter

D   modulating frequency and the modulation index

A-005-005-010 **(C)**

What is the significant bandwidth of an FM-phone transmission having a +/- 5-kHz deviation and a 3-kHz modulating frequency?

A   5 kHz

B   3 kHz

C   16 kHz

D   8 kHz

A-005-005-011 **(D)**

What is the frequency deviation for a 12.21-MHz reactance-modulated oscillator in a +/- 5-kHz deviation, 146.52-MHz FM-phone transmitter?

A   +/- 12 kHz

B   +/- 5 kHz

C   +/- 41.67 Hz

D   +/- 416.7 Hz

A-005-006-001 **(A)**

If the signals of two repeater transmitters mix together in one or both of their final amplifiers and unwanted signals at the sum and difference frequencies of the original signals are generated and radiated, what is this called?

A   Intermodulation interference

B   Neutralization

C   Adjacent channel interference

D   Amplifier desensitization

A-005-006-002 **(C)**

How does intermodulation interference between two repeater transmitters usually occur?

A   When they are in close proximity and the signals cause feedback in one or both of their final amplifiers

B   When the signals are reflected out of phase by aircraft passing overhead

C   When they are in close proximity and the signals mix in one or both of their final amplifiers

D   When the signals are reflected in phase by aircraft passing overhead

A-005-006-003 **(C)**

How can intermodulation interference between two repeater transmitters in close proximity often be reduced or eliminated?

A   By installing a high-pass filter in the antenna transmission line

B   By using a Class C final amplifier with high driving power

C   By installing a terminated circulator or ferrite isolator in the transmission line to the transmitter and duplexer

D   By installing a low-pass filter in the antenna transmission line

A-005-006-004 **(A)**

If a receiver tuned to 146.70 MHz receives an intermodulation product signal whenever a nearby transmitter transmits on 146.52, what are the two most likely frequencies for the other interfering signal?

A   146.34 MHz and 146.61 MHz

B   146.88 MHz and 146.34 MHz

C   146.01 MHz and 147.30 MHz

D   73.35 MHz and 239.40 MHz

A-005-006-005 **(D)**

What type of circuit varies the tuning of an amplifier tank circuit to produce FM signals?

A   A balanced modulator

B   A double balanced mixer

C   An audio modulator

D   A phase modulator

A-005-006-006 **(D)**

What audio shaping network is added at an FM transmitter to attenuate the lower audio frequencies?

A   An audio prescaler

B   A heterodyne suppressor

C   A de-emphasis network

D   A pre-emphasis network

A-005-006-007 **(A)**

Which type of filter would be best to use in a 2-metre repeater duplexer?

A   A cavity filter

B   A DSP filter

C   An L-C filter

D   A crystal filter

A-005-006-008 **(D)**

The characteristic difference between a phase modulator and a frequency modulator is:

A   the centre frequency

B   de-emphasis

C   frequency inversion

D   pre-emphasis

A-005-006-009 **(B)**

In most modern FM transmitters, to produce a better sound, a compressor and a clipper are placed:

A   in the microphone circuit, before the audio amplifier

B   between the audio amplifier and the modulator

C   between the multiplier and the PA

D   between the modulator and the oscillator

A-005-006-010 **(D)**

Three important parameters to be verified in an FM transmitter are:

A   distortion, bandwidth and sideband power

B   modulation, pre-emphasis and carrier suppression

C   frequency stability, de-emphasis and linearity

D   power, frequency deviation and frequency stability

A-005-006-011 **(D)**

Intermodulation interference products are not typically associated with which of the following:

A   final amplifier stage

B   receiver frontend

C   passive intermodulation

D   intermediate frequency stage

A-005-007-001 **(A)**

Maintaining the peak RF output of a SSB transmitter at a relatively constant level requires a circuit called the:

A   automatic level control (ALC)

B   automatic gain control (AGC)

C   automatic output control (AOC)

D   automatic volume control (AVC)

A-005-007-002 **(D)**

Speech compression associated with SSB transmission implies:

A   full amplification of high level signals and reducing or eliminating signals amplification of low level

B   a lower signal-to-noise ratio

C   circuit level instability

D   full amplification of low level signals and reducing or eliminating amplification of high level signals

A-005-007-003 **(D)**

Which of the following functions is not included in a typical digital signal processor?

A   Analog to digital converter

B   Digital to analog converter

C   Mathematical transform

D   Aliasing amplifier

A-005-007-004 **(C)**

How many bits are required to provide 256 discrete levels, or a ratio of 256:1?

A   16 bits

B   4 bits

C   8 bits

D   6 bits

A-005-007-005 **(C)**

Adding one bit to the word length, is equivalent to adding _____ dB to the dynamic range of the digitizer:

A   4 dB

B   3 dB

C   6 dB

D   1 dB

A-005-007-006 **(D)**

What do you call the circuit which employs an analog to digital converter, a mathematical transform, a digital to analog converter and a low pass filter?

A   Digital formatter

B   Mathematical transformer

C   Digital transformer

D   Digital signal processor

A-005-007-007 **(B)**

Which principle is not associated with analog signal processing?

A   Clipping

B   Frequency division

C   Compression

D   Bandwidth limiting

A-005-007-008 **(A)**

Which of the following is not a method used for peak limiting, in a signal processor?

A   Frequency clipping

B   RF clipping

C   Compression

D   AF clipping

A-005-007-009 **(A)**

What is the undesirable result of AF clipping in a speech processor?

A   Increased harmonic distortion

B   Reduced average power

C   Increased average power

D   Reduction in peak amplitude

A-005-007-010 **(D)**

Which description is not correct? You are planning to build a speech processor for your transceiver. Compared to AF clipping, RF clipping:

A   has less distortion

B   is more expensive to implement

C   is more difficult to implement

D   is easier to implement

A-005-007-011 **(B)**

Automatic Level Control (ALC) is another name for:

A   AF clipping

B   RF compression

C   AF compression

D   RF clipping

A-005-008-001 **(B)**

What digital code consists of elements having unequal length?

A   ASCII

B   Varicode

C   AX.25

D   Baudot

A-005-008-002 **(C)**

Open Systems Interconnection (OSI) model standardizes communications functions as layers within a data communications system. Amateur digital radio systems often follow the OSI model in structure. What is the base layer of the OSI model involving the interconnection of a packet radio TNC to a computer terminal?

A   The network layer

B   The transport layer

C   The physical layer

D   The link layer

A-005-008-003 **(D)**

What is the purpose of a Cyclic Redundancy Check (CRC)?

A   Lossy compression

B   Error correction

C   Lossless compression

D   Error detection

A-005-008-004 **(A)**

What is one advantage of using ASCII rather than Baudot code?

A   It includes both upper and lower case text characters in the code

B   ASCII includes built-in error correction

C   ASCII characters contain fewer information bits

D   The larger character set allows store-and-forward

A-005-008-005 **(C)**

What type of error control system is used in AMTOR ARQ (Mode A)?

A   Each character is sent twice

B   Mode A AMTOR does not include an error control system

C   The receiving station automatically requests repeats when needed

D   The receiving station checks the frame check sequence (FCS) against the transmitted FCS

A-005-008-006 **(D)**

What error-correction system is used in AMTOR FEC (Mode B)?

A   Mode B AMTOR does not include an error-correction system

B   The receiving station automatically requests repeats when needed

C   The receiving station checks the frame check sequence (FCS) against the transmitted FCS

D   Each character is sent twice

A-005-008-007 **(A)**

APRS (Automatic Packet Reporting System) does NOT support which one of these functions?

A   Automatic link establishment

B   Two-way messaging

C   Telemetry

D   Amateur-specific local information broadcast

A-005-008-008 **(B)**

Which algorithm may be used to create a Cyclic Redundancy Check (CRC)?

A   Lempel-Ziv routine

B   Hash function

C   Dynamic Huffman code

D   Convolution code

A-005-008-009 **(B)**

The designator AX.25 is associated with which amateur radio mode?

A   spread spectrum speech

B   packet

C   RTTY

D   ASCII

A-005-008-010 (B)

How many information bits are included in the Baudot code?

A 6
B 5
C 7
D 8

A-005-008-011 (B)

How many information bits are included in the ISO-8859 extension to the ASCII code?

A 5
B 8
C 7
D 6

A-005-009-001 (C)

What term describes a wide-band communications system in which the RF carrier varies according to some predetermined sequence?

A AMTOR
B Time domain frequency modulation
C Spread spectrum communication
D Amplitude-companded single sideband

A-005-009-002 (D)

What is the term used to describe a spread spectrum communications system where the centre frequency of a conventional carrier is changed many times per second in accordance with a pseudorandom list of channels?

A Direct sequence
B Time-domain frequency modulation
C Frequency companded spread spectrum
D Frequency hopping

A-005-009-003 (A)

What term is used to describe a spread spectrum communications system in which a very fast binary bit stream is used to shift the phase of an RF carrier?

A Direct sequence
B Frequency hopping
C Phase companded spread spectrum
D Binary phase-shift keying

A-005-009-004 (C)

Frequency hopping is used with which type of transmission?

A Packet
B RTTY
C Spread spectrum
D AMTOR

A-005-009-005 (C)

Direct sequence is used with which type of transmission?

A Packet
B RTTY
C Spread spectrum
D AMTOR

A-005-009-006 (C)

Which type of signal is used to produce a predetermined alteration in the carrier for spread spectrum communication?

A Quantizing noise
B Random noise sequence
C Pseudo-random sequence
D Frequency-companded sequence

A-005-009-007 (C)

Why is it difficult to monitor a spread spectrum transmission?

A It varies too quickly in amplitude
B The signal is too distorted for comfortable listening
C Your receiver must be frequency-synchronized to the transmitter
D It requires narrower bandwidth than most receivers have

A-005-009-008 (A)

What is frequency hopping spread spectrum?

A The carrier frequency is changed in accordance with a pseudo-random list of channels
B The carrier is amplitude-modulated over a wide range called the spread
C The carrier is frequency-companded
D The carrier is phase-shifted by a fast binary bit stream

A-005-009-009 **(D)**

What is direct-sequence spread spectrum?

A The carrier is amplitude modulated over a range called the spread

B The carrier is frequency-companded

C The carrier is altered in accordance with a pseudo-random list of channels

D The carrier is phase-shifted by a fast binary bit stream

A-005-009-010 **(C)**

Why are received spread-spectrum signals so resistant to interference?

A If interference is detected by the receiver, it will signal the transmitter to change frequencies

B The high power used by a spread-spectrum transmitter keeps its signal from being easily overpowered

C Signals not using the spectrum-spreading algorithm are suppressed in the receiver

D The receiver is always equipped with a special digital signal processor (DSP) interference filter

A-005-009-011 **(D)**

How does the spread-spectrum technique of frequency hopping work?

A If interference is detected by the receiver, it will signal the transmitter to change frequency

B If interference is detected by the receiver, it will signal the transmitter to wait until the frequency is clear

C A pseudo-random bit stream is used to shift the phase of an RF carrier very rapidly in a particular sequence

D The frequency of an RF carrier is changed very rapidly according to a particular pseudo-random sequence

A-006-001-001 **(C)**

What are the advantages of the frequency conversion process in a superheterodyne receiver?

A Automatic soft-limiting and automatic squelching

B Automatic squelching and increased sensitivity

C Increased selectivity and optimal tuned circuit design

D Automatic detection in the RF amplifier and increased sensitivity

A-006-001-002 **(A)**

What factors should be considered when selecting an intermediate frequency?

A Image rejection and responses to unwanted signals

B Noise figure and distortion

C Interference to other services

D Cross-modulation distortion and interference

A-006-001-003 **(B)**

One of the greatest advantages of the double-conversion over the single-conversion receiver is that it:

A produces a louder signal at the output

B greater reduction of image interference for a given front end selectivity

C is much more stable

D is much more sensitive

A-006-001-004 **(A)**

In a communications receiver, a crystal filter would be located in the:

A IF circuits

B local oscillator

C audio output stage

D detector

A-006-001-005 **(B)**

A multiple conversion superheterodyne receiver is more susceptible to spurious responses than a single-conversion receiver because of the:

A AGC being forced to work harder causing the stages concerned to overload

B additional oscillators and mixing frequencies involved in the design

C poorer selectivity in the IF caused by the multitude of frequency changes

D greater sensitivity introducing higher levels of RF to the receiver

A-006-001-006 **(C)**

In a dual-conversion superheterodyne receiver what are the respective aims of the first and second conversion:

A selectivity and dynamic range

B image rejection and noise figure

C image rejection and selectivity

D selectivity and image rejection