

1) The modulation technique used for mobile communication systems during world war II was

- a. Amplitude modulation
- b. Frequency modulation
- c. ASK
- d. FSK

ANSWER: Frequency modulation

2) ———— introduced Frequency Modulation for mobile communication systems in 1935.

- a. Edwin Armstrong
- b. Albert Einstein
- c. Galileo Galilei
- d. David Bohm

ANSWER: Edwin Armstrong

3) The early FM push-to-talk telephone systems were used in

- a. Simplex mode
- b. Half duplex mode
- c. Full duplex mode
- d. None of the above

ANSWER: Half duplex mode

4) DECT stands for

- a. Digital European Cellular Telex
- b. Digitized Emergency Cellular Telephone
- c. Digital European Cordless Telephone
- d. Digital European Cellular Telephone

ANSWER: Digital European Cordless Telephone

5) World's first cellular system was developed by

- a. Nippon Telephone and Telegraph (NTT)
- b. Bellcore and Motorola
- c. AT&T Bell Laboratories
- d. Qualcomm

ANSWER: Nippon Telephone and Telegraph (NTT)

6) Paging systems were based on

- a. Simplex systems
- b. Half duplex systems
- c. Full duplex systems
- d. None of the above

ANSWER: Simplex systems

7) Paging systems could be used to

- a. Send numeric messages
- b. Send alphanumeric messages
- c. Voice message
- d. All of the above

ANSWER: All of the above

8) Garage door opener is a

- a. Transmitter
- b. Receiver
- c. Transceiver
- d. None of the above

ANSWER: Transmitter

9) Carrier frequency of a TV remote control is in the range

- a. of Infra red
- b. < 100 MHz

c. < 1 GHz

d. < 2 GHz

ANSWER: of Infra red

10) Half duplex system for communication has

a. Communication in single direction

b. Communication in single direction at a time

c. Communication in both directions at the same time

d. None of the above

ANSWER: Communication in single direction at a time

11) MIN stands for

a. Mobile Identification Number

b. Mobile Internet

c. Mobility In Network

d. None of the above

ANSWER: Mobile Identification Number

12) The process of transferring a mobile station from one base station to another is

a. MSC

b. Roamer

c. Hand off

d. Forward channel

ANSWER: Hand off

13) PCN is

a. Wireless concept of making calls

b. For receiving calls

c. Irrespective of the location of the user

d. All of the above

ANSWER: All of the above

14) IMT-2000 is a digital mobile system that functions as

a. Pager

b. Cordless

c. Low earth orbit satellites

d. All of the above

ANSWER: All of the above

15) The 2G cellular network uses

a. TDMA/FDD

b. CDMA/FDD

c. Digital modulation formats

d. All of the above

ANSWER: All of the above

16) NADC is a 2G standard for

a. TDMA

b. CDMA

c. Both a & b

d. None of the above

ANSWER: TDMA

17) 2G CDMA standard – cdma one supports up to

a. 8 users

b. 64 users

c. 32 users

d. 116 users

ANSWER: 64 users

- 18) 2G standards support
- a. Limited internet browsing
 - b. Short Messaging Service
 - c. Both a & b
 - d. None of the above

ANSWER: Both a & b

- 19) The 2G GSM technology uses a carrier separation of
- a. 1.25 MHz
 - b. 200 KHz
 - c. 30 KHz
 - d. 300 KHz

ANSWER: 200 KHz

- 20) 3G W-CDMA is also known as
- a. UMTS
 - b. DECT
 - c. DCS-1800
 - d. ETACS

ANSWER: UMTS

- 21) Commonly used mode for 3G networks is
- a. TDMA
 - b. FDMA
 - c. TDD
 - d. FDD

ANSWER: FDD

- 22) The minimum spectrum allocation required for W-CDMA is
- a. 5MHz
 - b. 2MHz
 - c. 500KHz
 - d. 100KHz

ANSWER: 5MHz

- 23) CDMA2000 1xEV provides high speed data access with channel allocation of
- a. 5 MHz
 - b. 50 MHz
 - c. 1.25 MHz
 - d. 4 MHz

ANSWER: 1.25 MHz

- 24) In TD-SDMA, there is a frame of _____ milliseconds and the frame is divided into _____ time slots.
- a. 5, 7
 - b. 7, 5
 - c. 2, 5
 - d. 5, 2

ANSWER: 5, 7

- 25) The interference between the neighboring base stations is avoided by
- a. Assigning different group of channels
 - b. Using transmitters with different power level
 - c. Using different antennas
 - d. All of the above

ANSWER: Assigning different group of channels

- 26) Radio capacity may be increased in cellular concept by

- a. Increase in radio spectrum
- b. Increasing the number of base stations & reusing the channels
- c. Both a & b
- d. None of the above

ANSWER: Increasing the number of base stations & reusing the channels

27) The shape of the cellular region for maximum radio coverage is

- a. Circular
- b. Square
- c. Oval
- d. Hexagon

ANSWER: Hexagon

28) Hexagon shape is used for radio coverage for a cell because

- a. It uses the maximum area for coverage
- b. Fewer number of cells are required
- c. It approximates circular radiation pattern
- d. All of the above

ANSWER: All of the above

29) Centre excited hexagonal cells use

- a. Sectorized directional antennas
- b. Omni directional antennas
- c. Yagi uda antennas
- d. None of the above

ANSWER: Omni directional antennas

30) Spectrum Efficiency of a cellular network is

- a. The traffic carried by whole network
- b. The traffic carried per cell divided by the bandwidth of the system and the area of a cell
- c. Expressed in Erlang /MHz /km²
- d. Both b and c
- e. Both a and c

ANSWER: Both b and c

31) The advantage of using frequency reuse is

- a. Increased capacity
- b. Limited spectrum is required
- c. Same spectrum may be allocated to other network
- d. All of the above

ANSWER: All of the above

32) The strategies acquired for channel assignment are

- a. Fixed
- b. Dynamic
- c. Regular
- d. Both a and b
- e. Both b and c

ANSWER: Both a and b

33) In a fixed channel assignment strategy, if all the assigned channels are occupied, the call

- a. Gets transferred to another cell
- b. Gets blocked
- c. Is kept on waiting
- d. All of the above

ANSWER: Gets blocked

34) In a fixed channel assignment strategy

- a. Each cell is assigned a predetermined set of frequencies
- b. The call is served by unused channels of the cell
- c. The call gets blocked if all the channels of the cell are occupied
- d. All of the above

ANSWER: All of the above

35) In a dynamic channel assignment strategy,

- a. Voice channels are not permanently assigned
- b. The serving base station requests for a channel from MSC
- c. MSC allocates the channel according to the predetermined algorithm
- d. All of the above

ANSWER: All of the above

36) Advantage of using Dynamic channel assignment is

- a. Blocking is reduced
- b. Capacity of the system is increased
- c. Both a & b
- d. None of the above

ANSWER: Both a & b

37) Disadvantage of using Dynamic channel assignment is

- a. More storage required
- b. Calculations and analysis is increased
- c. Both a & b
- d. None of the above

ANSWER: Both a & b

38) In Dynamic channel assignment, any channel which is being used in one cell can be reassigned simultaneously to another cell in the system at a reasonable distance.

- a. True
- b. False

ANSWER: True

39) In Handoff

- a. Process of transferring the call to the new base station
- b. Transfers the call
- c. New channel allocation is done
- d. All of the above

ANSWER: All of the above

40) Delay in handoffs is caused due to

- a. Weak signal conditions
- b. High traffic conditions
- c. Un availability of the channel
- d. All of the above

ANSWER: All of the above

41) Inter system Handoffs are done

- a. When mobile station moves in two cellular systems with different MSC
- b. When mobile station moves between two cellular systems
- c. When mobile station receives more power from other base station than the serving base station
- d. All of the above

ANSWER: All of the above

42) When a fraction of assigned channel is reserved for handoffs, it is

- a. Guard channel concept
- b. Fixed channel assignment
- c. Dynamic channel assignment
- d. None of the above

ANSWER: Guard channel concept

43) While handoffs, the termination of call may be avoided by

- a. Providing Guard channel**
- b. Queuing of handoffs**
- c. Both a & b**
- d. None of the above**

ANSWER: Both a & b

44) Dwell time is the time for

- a. A call within the cell**
- b. Hand off**
- c. Waiting for channel allocation**
- d. None of the above**

ANSWER: A call within the cell

45) Dwell time depends upon

- a. Interference**
- b. Distance between the subscriber and the base station**
- c. Propagation of call**
- d. All of the above**

ANSWER: All of the above

46) In Mobile Assisted Handoff (MAHO), the handoff takes place when

- a. The power received by the mobile station from other base station is more than the serving base station**
- b. The channel allocated is not available**
- c. The mobile station has no signal**
- d. All of the above**

ANSWER: The power received by the mobile station from other base station is more than the serving base station

47) Mobile Assisted Handoff (MAHO) provides

- a. Faster handoffs**
- b. Suitability for frequent handoffs**
- c. MSC need not monitor the signal strength**
- d. All of the above**

ANSWER: All of the above

48) Trunking in a cellular network refers to

- a. Termination of a call**
- b. Spectrum unavailability**
- c. Accommodating large number of users in limited spectrum**
- d. All of the above**

ANSWER: Accommodating large number of users in limited spectrum

49) When all of the radio channels are in use in a trunking system

- a. The user is blocked**
- b. The access to the system is denied**
- c. The queue may be provided**
- d. All of the above**

ANSWER: All of the above

50) Umbrella cell approach

- a. Uses large and small cells**
- b. Uses different antenna heights**
- c. Is used for high speed users with large coverage area and low speed users with small coverage area**
- d. All of the above**

ANSWER: All of the above

- 51) Interference in cellular systems is caused by
- a. Two base stations operating in same frequency band
 - b. Two calls in progress in nearby mobile stations
 - c. Leakage of energy signals by non cellular systems into cellular frequency band
 - d. All of the above

ANSWER: All of the above

- 52) Interference in frequency bands may lead to
- a. Cross talk
 - b. Missed calls
 - c. Blocked calls
 - d. All of the above

ANSWER: All of the above

- 53) Co-channel reuse ratio depends upon
- a. Radius of the cell
 - b. Distance between the centers of the co channel cells
 - c. Frequency allocation of nearest cells
 - d. Both a and b
 - e. Both b and c

ANSWER: Both a and b

- 14) Increase in Co- channel reuse ratio indicates
- a. Better transmission quality
 - b. Larger capacity
 - c. Low co-channel interference
 - d. Both a and c
 - e. Both a and b

ANSWER: Both a and c

- 55) Grade of service refers to
- a. Accommodating large number of users in limited spectrum
 - b. Ability of a user to access trunked system during busy hour
 - c. Two calls in progress in nearby mobile stations
 - d. High speed users with large coverage area

ANSWER: Ability of a user to access trunked system during busy hour

- 56) Traffic intensity is expressed in
- a. Erlangs /MHz /km²
 - b. Erlangs
 - c. λ / sec
 - d. dB/sec

ANSWER: Erlangs

- 57) The techniques used to improve the capacity of cellular systems are
- a. Splitting
 - b. Sectoring
 - c. Coverage zone approach
 - d. All of the above

ANSWER: All of the above

- 58) Distributed antenna systems are used at
- a. Transmitters of mobile systems
 - b. Transmitters of base stations
 - c. Inputs and outputs of repeaters
 - d. Receivers of mobile stations

ANSWER: Inputs and outputs of repeaters

- 59) Antenna down tilting refers to
- Focusing radio energy towards ground
 - Decreasing the strength of antenna
 - Decreasing the S/N ratio at the antenna input
 - All of the above

ANSWER: Focusing radio energy towards ground

- 60) Diffraction, at high frequencies, depends upon
- Geometry of the object
 - Polarization of the incident wave
 - Amplitude of the incident wave
 - Frequency of the incident wave
- 1 and 2 are correct
 - 1, 2 and 3 are correct
 - 2 and 3 are correct
 - All are correct

ANSWER: 1, 2 and 3 are correct

- 61) The rainbow pattern seen on a CD is an example of
- Reflection
 - Refraction
 - Diffraction
 - None of the above

ANSWER: Diffraction

- 62) Fresnel Reflection Coefficient is a factor of
- Polarization of the wave
 - Properties of the material at which reflection occurs
 - Angle of incidence of wave
- 1 and 2 are correct
 - 1 and 3 are correct
 - All the three are correct
 - 2 and 3 are correct

ANSWER: All the three are correct

- 63) When a wave falls on a perfect conductor
- Wave is partially reflected and partially transmitted
 - All incident energy is reflected back without loss of energy
 - Part of energy gets absorbed
 - Both a and c

ANSWER: All incident energy is reflected back without loss of energy

- 64) Brewster angle is the angle at which
- No reflection occurs at the first medium
 - Reflection coefficient is zero
 - The wave gets refracted in the direction of source
 - Both a and b
 - Both a and c

ANSWER: Both a and b

- 65) Fading is caused due to
- Multi path propagation
 - Obstacles
 - Frequency variations at the source
 - Variation in amplitude and phase at receiver
- 1 and 2 are correct
 - 1, 2 and 4 are correct

c. 2 and 3 are correct

d. All are correct

ANSWER: 1, 2 and 4 are correct

66) Coherence time refers to

a. Time required to attain a call with the busy base station

b. Time required for synchronization between the transmitter and the receiver

c. Minimum time for change in magnitude and phase of the channel

d. None of the above

ANSWER: Minimum time for change in magnitude and phase of the channel

67) Fading due to shadowing is

a. Fading due to large obstructions

b. Large coherence time of the channel as compared to the delay constraints

c. Small coherence time of the channel as compared to the delay constraints

d. Both a and b

e. Both a and c

ANSWER: Both a and b

68) Deep fade is

1. Strong destructive interference

2. Drop in signal to noise ratio

3. Temporary failure of message transfer

a. 1 and 2 are correct

b. 1 and 3 are correct

c. 2 and 3 are correct

d. All are correct

ANSWER: All are correct

69) Doppler spread refers to

a. Signal fading due to Doppler shift in the channel

b. Temporary failure of message transfer

c. Large coherence time of the channel as compared to the delay constraints

d. All of the above

ANSWER: Signal fading due to Doppler shift in the channel

70) Friis free space equation

1. Is an expression for noise power

2. Is a function of transmitting and receiving antenna gain

3. Depends upon the distance between transmitting and receiving antenna

a. 1 and 2 are correct

b. 1 and 3 are correct

c. 2 and 3 are correct

d. All are correct

ANSWER: 2 and 3 are correct

71) The free space model of propagation refers to

1. Unobstructed line of sight between the transmitter and receiver

2. Satellite communication systems and Microwave line of sight radio links

3. Propagation along the ground surface

a. 1 and 2 are correct

b. 1 and 3 are correct

c. 2 and 3 are correct

d. All the three are correct

ANSWER: 1 and 2 are correct

72) According to Friis free space equation

1. Received power falls with square of the distance between the transmitter and receiver
2. Increases with square of the distance between the transmitter and receiver
3. Received power increases with gains of transmitting and receiving antennas

- a. 1 and 2 are correct
- b. 1 and 3 are correct
- c. All the three are correct
- d. 2 and 3 are correct

ANSWER: All the three are correct

73) EIRP is

1. Effective Isotropic Radiated Power
2. Maximum radiated power available by the transmitter
3. A factor of power and gain of transmitter

- a. 1 and 2 are correct
- b. 1 and 3 are correct
- c. All the three are correct
- d. 2 and 3 are correct

ANSWER: All the three are correct

74) Spread spectrum modulation involves

1. PN sequence for modulation
2. Large bandwidth
3. Multiple users

- a. 1 and 2 are correct
- b. 1 and 3 are correct
- c. 2 and 3 are correct
- d. All the three are correct

ANSWER: All the three are correct

75) PN sequence at the decoder acts as a locally generated carrier at the receiver and decodes the signal using

- a. Correlator
- b. Adder
- c. Frequency divider
- d. PLL

ANSWER: Correlator

76) In spread spectrum technique, the multiple users are assigned with

- a. Same spectrum and same PN code
- b. Same spectrum and different PN code
- c. Different spectrum and different PN code
- d. Different spectrum and same PN code

ANSWER: Same spectrum and different PN code

77) Advantage of using Spread Spectrum modulation is/are

1. Interference rejection capability
2. Frequency planning is not required
3. Resistance to multipath fading
4. ISI is lesser

- a. 1 and 2 are correct
- b. 1, 2 and 3 are correct
- c. 2 and 3 are correct
- d. All the four are correct

ANSWER: All the four are correct

78) Direct sequence spread spectrum demodulation uses

- a. DPSK
- b. FSK
- c. ASK
- d. QPSK

ANSWER: DPSK

79) Fast hopping is

- a. More than one frequency hop during each symbol
- b. Hopping rate greater than or equal to information symbol rate
- c. One or more symbols transmitted between frequency hops
- d. Both a and b
- e. Both b and c

ANSWER: Both a and b

80) Slow frequency hopping refers to

- a. One or more symbols transmitted in time interval between frequency hops
- b. More than one frequency hop during each symbol
- c. Hopping rate greater than or equal to information symbol rate
- d. Both a and c are correct

ANSWER: One or more symbols transmitted in time interval between frequency hops

81) Probability of outage refers to

- a. Noise developed at the receiver
- b. Number of bit errors during transmission
- c. Signal to noise ratio
- d. All of the above

ANSWER: Number of bit errors during transmission

82) The digital modulation technique used in frequency selective channels is

- a. FSK
- b. ASK
- c. BPSK
- d. QPSK

ANSWER: BPSK

83) Working of Adaptive Equalizers include

- a. Training
- b. Tracking
- c. Modulation
- d. Both a and b
- e. All a, b and c are correct

ANSWER: Both a and b

84) The time span for which the equalizer converges depends upon

1. Equalizer algorithm
 2. Equalizer structure
 3. Rate of change of multipath radio channel
 4. Amplitude of signal
- a. 1 and 2 are correct
 - b. 1, 2 and 3 are correct
 - c. 2 and 3 are correct
 - d. All the four are correct

ANSWER: 1, 2 and 3 are correct

85) The Linear Equalizer may be implemented as

- a. FIR filter
- b. Lattice filter
- c. Low pass filter

d. Both a and b

e. Both a and c

ANSWER: Both a and b

86) Linear equalizer is also known as

a. Transversal filter

b. Lattice filter

c. Low pass filter

d. None of the above

ANSWER: Transversal filter

87) The methods used for non linear equalization are

a. Decision Feedback Equalization

b. Maximum Likelihood Symbol Detection

c. Maximum Likelihood Sequence Estimation

a. 1 and 2 are correct

b. 1, 2 and 3 are correct

c. 2 and 3 are correct

d. None of the above

ANSWER: 1, 2 and 3 are correct

88) The performance of algorithms for Adaptive Equalization are given by

1. Rate of convergence

2. Computational complexity

3. Numerical properties

4. Frequency change

a. 1 and 2 are correct

b. 1, 2 and 3 are correct

c. 2 and 3 are correct

d. All are correct

ANSWER: 1, 2 and 3 are correct

89) Computational complexity of an algorithm refers to the

a. Number of operations for one iteration of algorithm

b. Inaccuracies in the mathematical analysis

c. Noise produced during one complete iteration of algorithm

d. All of the above

ANSWER: Number of operations for one iteration of algorithm

90) The algorithms acquired for adaptive equalization are

1. Zero forcing algorithm

2. Least mean squares algorithm

3. Recursive least squares algorithm

a. 1 and 2 are correct

b. 1, 2 and 3 are correct

c. 2 and 3 are correct

d. None of the above

ANSWER: 1, 2 and 3 are correct

91) Fractionally spaced equalizer acts as

a. Matched filter

b. Equalizer

c. Demodulator

d. Both a and b

e. All a, b and c are correct

ANSWER: Both a and b

92) Diversity employs the decision making at

- a. Transmitter
- b. Receiver
- c. Transmitter and receiver
- d. Communication channel

ANSWER: Receiver

93) The diversity schemes are based on

- 1. Time diversity
- 2. Frequency diversity
- 3. Space diversity
- 4. Polarization diversity

- a. 1 and 2 are correct
- b. 1, 2 and 3 are correct
- c. 2 and 3 are correct
- d. All the four are correct

ANSWER: All the four are correct

94) In time diversity

- a. Multiple versions of signals are transmitted at different time instants
- b. The signal is transmitted using multiple channels
- c. Signal is transmitted with different polarization
- d. All of the above

ANSWER: Multiple versions of signals are transmitted at different time instants

95) RAKE receiver is

- 1. Several sub receivers
 - 2. Several correlators
 - 3. Fingers
 - 4. Equalization based
- a. 1 and 2 are correct
 - b. 1, 2 and 3 are correct
 - c. 2 and 3 are correct
 - d. All the four are correct

ANSWER: 1, 2 and 3 are correct

96) The RAKE receiver involves the steps

- a. Correlator, estimation of transmitted signal, demodulation, bit decision
- b. Estimation of transmitted signal, correlator, demodulation, bit decision
- c. Estimation of transmitted signal, demodulation, correlator, bit decision
- d. Estimation of transmitted signal, demodulation, bit decision, correlator

ANSWER: Correlator, estimation of transmitted signal, demodulation, bit decision

97) Search window of a RAKE receiver is

- a. Frequency band of the channel
- b. Range of the time delays
- c. Range of noise
- d. All of the above

ANSWER: Range of the time delays

98) Speech Coders are categorized on the basis of

- a. Signal compression techniques
- b. Frequency of signal
- c. Bandwidth of the signal
- d. All of the above

ANSWER: Signal compression techniques

99) Waveform coders and Vocoders are the types of

- a. Speech coders
- b. Modulation technique
- c. Frequency translation methods
- d. Channel allocation for transmission

ANSWER: Speech coders

100) PCM, DPCM, DM, ADPCM are the types of

- a. Vocoders
- b. Waveform coders
- c. Channel allocation for transmission
- d. All of the above

ANSWER: Waveform coders

101) Speech coding technique that is independent of the source is

- a. Vocoders
- b. Waveform coders
- c. Both a & b
- d. None of the above

ANSWER: Waveform coders

102) Advantage of using waveform coders is

- 1. Independent of the signal source
 - 2. Less complexity
 - 3. Suitable for noisy environments
- a. 1 and 2 are correct
 - b. 1 and 3 are correct
 - c. 2 and 3 are correct
 - d. All the three are correct

ANSWER: All the three are correct

103) The type of frequency domain coding that divides the speech signal into sub bands is

- a. Waveform coding
- b. Vocoders
- c. Block transform coding
- d. Sub-band coding

ANSWER: Sub-band coding

104) The speech coding technique that is dependent on the prior knowledge of the signal is

- a. Waveform coders
- b. Vocoders
- c. Sub band coding
- d. Block transform coding

ANSWER: Vocoders

105) The steps involved in Channel vocoders for speech transmission are

- a. Envelope detection, sampling, encoding, multiplexing
- b. Sampling, Envelope detection, encoding, multiplexing
- c. Envelope detection, encoding, sampling, multiplexing
- d. Sampling, Envelope detection, multiplexing, encoding

ANSWER: Envelope detection, sampling, encoding, multiplexing

106) Vocal tract cepstral coefficients and excitation coefficients are separated by

- a. Samplers
- b. Linear filters
- c. Encoders
- d. Multiplexers

ANSWER: Linear filters

107) In voice excited vocoders, PCM transmission helps in transmission of

- a. High frequency bands of speech
- b. Low frequency bands of speech
- c. Multiplexed signals
- d. Modulated signals

ANSWER: Low frequency bands of speech

108) Linear predictive coders are based on the principle that

- 1. Current signal sample is obtained from linear combination of past samples
- 2. Current signal sample is independent of past samples
- 3. These are time domain vocoders
- 4. They are among low bit rate vocoders

a. 1, 3 and 4 are correct

b. 2, 3 and 4 are correct

c. 1 and 4 are correct

d. All the four are correct

ANSWER: 1, 3 and 4 are correct

109) Multi pulse excited LPC includes

- 1. Multiple pulses per period
- 2. Minimization of weighted mean square error
- 3. Better speech quality
- 4. Pitch detection is not required

a. 1 and 4 are correct

b. 1 and 3 are correct

c. 2 and 4 are correct

d. All four are correct

ANSWER: All four are correct

110) In residual excited LPC,

- a. The residue of subtraction of generated and original signal is quantized at the transmitter
- b. Pitch detection is not required
- c. Multiple pulses per period
- d. Coder and decoders have predetermined set of codes

ANSWER: The residue of subtraction of generated and original signal is quantized at the transmitter

111) The speech sequence in GSM Codec consists of

- a. Pre emphasis, segmentation, windowing, filtering
- b. Windowing, Pre emphasis, segmentation, filtering
- c. Pre emphasis, windowing, segmentation, filtering
- d. Pre emphasis, segmentation, filtering, windowing

ANSWER: Pre emphasis, segmentation, windowing, filtering

112) The windowing technique used for speech coding in GSM Codec is

- a. Blackman window
- b. Welch window
- c. Cosine window
- d. Hamming window

ANSWER: Hamming window

113) The received signal at the GSM speech decoder is passed through

- a. STP filter
- b. LTP filter
- c. Quantizer
- d. PLL

ANSWER: LTP filter

114) In GSM Codec, the bits encoded for forward error correction are

- a. Ia bits
- b. Ib bits
- c. II bits
- d. Both a and b
- e. Both a and c

ANSWER: Both a and b

115) The speech coders are selected on the basis of

1. Robustness to transmission errors
2. Cell size
3. Type of modulation technique used
4. Distance between the transmitter and receiver

- a. 1 and 4 are correct
- b. 1, 2 and 3 are correct
- c. 2 and 4 are correct
- d. All four are correct

ANSWER: 1, 2 and 3 are correct

116) FDMA is the division of

- a. Time
- b. Phase
- c. Spectrum
- d. Amplitude

ANSWER: Spectrum

117) Guard band is

- a. The small unused bandwidth between the frequency channels to avoid interference
- b. The bandwidth allotted to the signal
- c. The channel spectrum
- d. The spectrum acquired by the noise between the signal

ANSWER: The small unused bandwidth between the frequency channels to avoid interference

118) Cable television is an example of

- a. TDMA
- b. FDMA
- c. CDMA
- d. SDMA

ANSWER: FDMA

119) In FDMA,

1. Each user is assigned unique frequency slots
2. Demand assignment is possible
3. Fixed assignment is possible
4. It is vulnerable to timing problems

- a. 1 and 2 are correct
- b. 2 and 4 are correct
- c. 1, 2 and 3 are correct
- d. All four are correct

ANSWER: 1, 2 and 3 are correct

120) FDMA demand assignment uses

1. Single channel per carrier
2. Multi channel per carrier
3. Single transmission in one time slot
4. Multi transmission in one time slot

- a. 1 and 2 are correct
- b. 2, 3 and 4 are correct

- c. 1, 2 and 3 are correct
- d. All four are correct

ANSWER: 1 and 2 are correct

121) The advantages of FDMA over TDMA includes

- 1. Division is simpler
 - 2. Propagation delays are eliminated
 - 3. Cheaper filters with less complicated logic functions
 - 4. Linearity
- a. 1, 2 and 3 are correct
 - b. 1 and 2 are correct
 - c. 1 and 4 are correct
 - d. All four are correct

ANSWER: 1 and 2 are correct

122) TDMA is a multiple access technique that has

- a. Different users in different time slots
- b. Each user is assigned unique frequency slots
- c. Each user is assigned a unique code sequence
- d. Each signal is modulated with frequency modulation technique

ANSWER: Different users in different time slots

123) In TDMA, the user occupies the whole bandwidth during transmission

- a. True
- b. False

ANSWER: True

124) TDMA allows the user to have

- a. Use of same frequency channel for same time slot
- b. Use of same frequency channel for different time slot
- c. Use of same time slot for different frequency channel
- d. Use of different time slot for different frequency channels

ANSWER: Use of same frequency channel for different time slot

125) GSM is an example of

- a. TDMA cellular systems
- b. FDMA cellular systems
- c. CDMA cellular systems
- d. SDMA cellular systems

ANSWER: TDMA cellular systems

126) TDMA is employed with a TDMA frame that has preamble. The preamble contains Address of base station and subscribers

- 1. Synchronization information
- 2. Frequency allotted
- 3. Coded sequence

- a. 1 and 2 are correct
- b. 1, 2 and 3 are correct
- c. 2 and 4 are correct
- d. All four are correct

ANSWER: 1 and 2 are correct

127) CDMA is

- 1. Spread spectrum technology
- 2. Using same communication medium
- 3. Every user stays at a certain narrowband channel at a specific time period
- 4. Each user has unique PN code

- a. 1, 2 and 3 are correct
- b. 2 and 3 are correct
- c. 1, 2 and 4 are correct
- d. All four are correct

ANSWER: 1, 2 and 4 are correct

128) Global Positioning System uses

- a. CDMA
- b. TDMA
- c. SDMA
- d. FDMA

ANSWER: CDMA

129) CDMA is advantageous over other Spread Spectrum techniques for

- 1. The privacy due to unique codes
- 2. It rejects narrow band interference
- 3. Resistance to multi path fading
- 4. Its ability to frequency reuse

- a. 1, 2 and 3 are correct
- b. 2 and 3 are correct
- c. 1, 2 and 4 are correct
- d. All the four are correct

ANSWER: All the four are correct

130) The wide band usage in CDMA helps in

- 1. Increased immunity to interference
- 2. Increased immunity to jamming
- 3. Multiple user access
- 4. Different spectrum allocation in different time slots

- a. 1, 2 and 3 are correct
- b. 2, 3 and 4 are correct
- c. 1, 2 and 4 are correct
- d. All the four are correct

ANSWER: 1, 2 and 3 are correct

131) The advantages of using a CDMA technique over other spread spectrum techniques are

- 1. Increased capacity
- 2. Easier handoff
- 3. Better measure of security
- 4. Multiple users occupy different spectrum at a time

- a. 1, 2 and 3 are correct
- b. 2, 3 and 4 are correct
- c. 1, 2 and 4 are correct
- d. All the four are correct

ANSWER: 1, 2 and 3 are correct

132) FHMA is

- 1. Spread spectrum technology
- 2. Using same communication medium
- 3. Every user has assigned unique frequency slot
- 4. Each user has unique PN code

- a. 1 and 2 are correct
- b. 1, 2 and 4 are correct
- c. 2 and 4 are correct
- d. All the four are correct

ANSWER: All the four are correct

133) OFDM is a technique of

1. Encoding digital data
 2. Multiple carrier frequencies
 3. Wide band digital communication
 4. 4G mobile communication
- a. 1, 2 and 3 are correct
 - b. 2 and 3 are correct
 - c. 1, 2 and 4 are correct
 - d. All the four are correct

ANSWER: All the four are correct

134) Advantages of using OFDM include

1. Avoids complex equalizers
 2. Low symbol rate and guard interval
 3. Avoids ISI
 4. Multiple users at same frequency
- a. 1, 2 and 3 are correct
 - b. 2 and 3 are correct
 - c. 1, 2 and 4 are correct
 - d. All the four are correct

ANSWER: All the four are correct

135) The troubles that OFDM faces over other spread spectrum techniques are

1. Sensitivity to Doppler shift
 2. Frequency synchronization problems
 3. Time synchronization problems
 4. Low efficiency due to guard intervals
- a. 1, 2 and 3 are correct
 - b. 2 and 3 are correct
 - c. 1, 2 and 4 are correct
 - d. All the four are correct

ANSWER: 1, 2 and 4 are correct

136) The guard interval is provided in OFDM

- a. To eliminate the need of pulse shaping filter
- b. To eliminate ISI
- c. High symbol rate
- d. Both a and b
- e. Both b and c

ANSWER: Both a and b

137) Packet radio refers to

- a. Multiple users on single channel
- b. Single user on multiple channels as per demand
- c. Multiple users on multiple channels at different time slots
- d. Multiple users with coding techniques

ANSWER: Multiple users on single channel

138) Disadvantages of packet radio are

- a. Induced delays
- b. Low spectral efficiency
- c. Large spectrum required
- d. Both a and b
- e. Both b and c

ANSWER: Both a and b

139) Pure ALOHA is a

- a. Random access protocol
- b. Scheduled access protocol
- c. Hybrid access protocol
- d. Demand access protocol

ANSWER: Random access protocol

140) The increase in number of users in PURE ALOHA causes

- a. Increase in delay
- b. Increase in probability of collision
- c. Increase in spectrum
- d. Both a and b
- e. Both a and c

ANSWER: Both a and b

141) SDMA technique employs

- a. Smart antenna technology
- b. Use of spatial locations of mobile units within the cell
- c. More battery consumption
- d. Both a and b are correct
- e. Both b and c are correct

ANSWER: Both a and b are correct

142) The advantage of using SDMA over other spread spectrum technique is

- a. Mobile station battery consumption is low
- b. Reduced spectral efficiency
- c. Increased spectral efficiency
- d. Both a and b are correct
- e. Both a and c are correct

ANSWER: Both a and c are correct

143) The increased capacity of SDMA is due to

- a. Focused signal transmitted into narrow transmission beams
- b. Smart antennas pointing towards mobile stations
- c. Use of different frequencies at same time slot
- d. Both a and b are correct
- e. Both a and c are correct

ANSWER: Both a and b are correct

144) Coherence time is

- a. Directly proportional to Doppler spread
- b. Indirectly proportional to Doppler spread
- c. Directly proportional to square of Doppler spread
- d. Directly proportional to twice of Doppler spread

ANSWER: Directly proportional to Doppler spread

145) Types of small scale fading, based on Doppler spread are

- a. Fast fading
- b. Frequency non selective fading
- c. Flat fading
- d. Frequency selective fading

ANSWER: Fast fading

146) Flat fading or frequency nonselective fading is a type of

- a. Multipath delay spread small scale fading
- b. Doppler spread small scale fading
- c. Both a & b
- d. None of the above

ANSWER: Multipath delay spread small scale fading

147) In Frequency Selective Fading, the

- a. Coherence Bandwidth of the channel is less than bandwidth of transmitted channel
- b. Coherence Bandwidth of the channel is more than bandwidth of transmitted channel
- c. Coherence Bandwidth of the channel is equal to bandwidth of transmitted channel
- d. None of the above

ANSWER: Coherence Bandwidth of the channel is less than bandwidth of transmitted channel

148) If coherence time of the channel is smaller than the symbol period of the transmitted signal, it is

- a. Fast fading
- b. Slow fading
- c. Frequency selective fading
- d. Frequency non selective fading

ANSWER: Fast fading

149) The power delay profile helps in determining

- a. Excess delay
- b. rms delay spread
- c. Excess delay spread
- d. All of the above

ANSWER: All of the above

150) Coherence bandwidth is

- a. Channel that passes all spectral components with equal gain
- b. The bandwidth of modulated signal
- c. Channel that passes all spectral components with linear phase
- d. Both a and c
- e. Both a and b

ANSWER: Both a and c

151) Small scale multipath propagation is caused due to waves with

- 1. Different propagation delays
 - 2. Different amplitudes
 - 3. Different phase
- a. 1 and 2 are correct
 - b. 1 and 3 are correct
 - c. 2 and 3 are correct
 - d. All the three are correct

ANSWER: All the three are correct

152) The effects of small scale multipath propagation are

- 1. Changes in signal strength
 - 2. Random frequency modulation
 - 3. Time dispersion
- a. 1 and 2 are correct
 - b. 1 and 3 are correct
 - c. 2 and 3 are correct
 - d. All the three are correct

ANSWER: All the three are correct

153) Impulse response of a multipath channel is determined by the fact that

- a. Mobile radio channel may be modeled as linear filter
- b. Impulse response is time varying
- c. Both a & b
- d. None of the above

ANSWER: Both a & b

154) The received signal from a multipath channel is expressed as

- a. Convolution of transmitted signal and impulse response
- b. Addition of transmitted signal and impulse response
- c. Subtraction of transmitted signal and impulse response
- d. All of the above
- e. None of the above

ANSWER: Convolution of transmitted signal and impulse response

155) Direct RF pulse system helps in calculating

- a. Impulse response in frequency domain
- b. Impulse response in phase domain
- c. Power delay of the channel
- d. All of the above

ANSWER: Power delay of the channel

156) The techniques used for small scale multipath measurements are

1. Direct RF pulse system
2. Spread spectrum sliding correlator channel sounding
3. Frequency domain channel sounding

- a. 1 and 2 are correct
- b. 1 and 3 are correct
- c. 2 and 3 are correct
- d. All the three are correct

ANSWER: All the three are correct