



BRAINWARE UNIVERSITY

Term End Examination 2021 - 22

Programme – Diploma in Electronics & Communication Engineering

Course Name – Digital and Microwave Communication Engineering

Course Code - DECE501

(Semester V)

Time : 1 Hr.15 Min.

Full Marks : 60

[The figure in the margin indicates full marks.]

Group-A

(Multiple Choice Type Question)

1 x 60=60

Choose the correct alternative from the following :

- (1) If the sampling takes place at a rate which is lower than the Nyquist rate then
 - a) reconstruction of the signal is not possible
 - b) an error called aliasing takes place
 - c) no effect on the reconstructed signal
 - d) none of these
- (2) The spectrum of a signal extends from 100 Hz to 2100 Hz. The minimum sampling frequency for the signal is
 - a) 6 kHz
 - b) 3 kHz
 - c) 1.5 kHz
 - d) 4 kHz
- (3) Which of the following is not a unit of information
 - a) Hz
 - b) bit
 - c) nat
 - d) decit
- (4) Which of the following gives minimum probability of error
 - a) ASK
 - b) FSK
 - c) PSK
 - d) both ASK and FSK
- (5) If the maximum instantaneous phase transition of a digital modulation technique is π modulation will be recognized as
 - a) DPSK
 - b) QPSK
 - c) BFSK
 - d) BPSK
- (6) Adaptive delta modulation is preferred over delta modulation as
 - a) it gives better noise performance
 - b) it uses lesser bits for encoding the signal
 - c) it has simpler circuitry
 - d) it does not suffer from slope overload and threshold effects
- (7) Inter symbol interference is problem in
 - a) AM transmission
 - b) FM transmission

- c) PCM transmission
- (8) Quantization noise occurs in
- a) time division multiplexing
 - b) frequency division multiplexing
 - c) pulse code modulation
 - d) pulse frequency modulation
- (9) The signal to quantization noise ratio in n bit PCM system
- a) is independent of value n
 - b) increase with increasing value of n
 - c) depends upon the sampling frequency employed
 - d) decreases with the increasing value of n
- (10) Companding is used
- a) to overcome quantization noise in PCM
 - b) to protect small signals in PCM from quantizing distortion
 - c) to overcome impulse noise
 - d) none of these
- (11) The main advantage of PCM system is
- a) lower bandwidth
 - b) lower power
 - c) lower noise
 - d) none of these
- (12) For generation of FSK the data pattern must be given in
- a) RZ format
 - b) NRZ format
 - c) split phase Manchester
 - d) none of these
- (13) The aliasing effect can be eliminated by
- a) using an antialiasing filter
 - b) reducing the sampling frequency
 - c) increasing the sampling frequency
 - d) increasing the modulating frequency
- (14) Which multiplexing technique transmits analog signal?
- a) FDM
 - b) TDM
 - c) WDM
 - d) Both FDM and TDM
- (15) In PCM the biggest disadvantage compared to analog modulation is
- a) large bandwidth
 - b) larger noise
 - c) inability to handle analog signals
 - d) incompatibility with TDM system
- (16) Flat-top sampling leads to
- a) aliasing
 - b) an aperture effect
 - c) loss of signal
 - d) none of these
- (17) The quantization error can be improved by
- a) increasing steps size
 - b) reducing steps size
 - c) keeping equal steps size
 - d) none of these
- (18) The number of bits required to represent a 256 level quantization in PCM is
- a) 7
 - b) 8
 - c) 5
 - d) 6
- (19) In a BPSK signal detector, the local oscillator has a fixed phase error of 20° . By what this phase error deteriorate the SNR at the output?
- a) $\cos^2 20^\circ$
 - b) $\cos 20^\circ$
 - c) $\cos 40^\circ$
 - d) $\cos 70^\circ$
- (20) For which of the following systems, the signal to noise ratio is the highest?
- a) PAM
 - b) PWM
 - c) PPM
 - d) Both PAM and PWM

- (21) What are the three steps in generating PCM in the correct sequence?
a) sampling, quantizing & encoding b) encoding, sampling & quantizing
c) sampling, encoding & quantizing d) quantizing, sampling & encoding
- (22) The signal to quantization noise ratio in a PCM system depends on
a) sampling rate b) number of quantization level
c) message signal bandwidth d) none of these
- (23) The main factor that determines the accuracy of a reconstructed PCM signal is the
a) signal bandwidth b) pulse repetition rate
c) pulse amplitude d) number of bits used for quantization
- (24) One disadvantage of adaptive delta modulation over linear delta modulation is that it
a) requires more bandwidth b) is more vulnerable to channel errors
c) requires a larger number of comparators in the encoder d) is not suitable for signals with periodic component
- (25) MSK (Minimum Shift Keying) is an orthogonal FSK scheme that gets its name from the fact that
a) the phase shift is minimum b) the error probability is minimum
c) the transmission power required is minimum d) the transmission bandwidth required is minimum
- (26) In case of data transmission, which one of the following systems will give the maximum probability error?
a) ASK b) FSK
c) PSK d) DPSK
- (27) The number of frequencies produced at the output of binary FSK modulator is
a) two b) infinite
c) three d) power of two
- (28) Two binary values are represented by two different frequencies in
a) ASK b) PSK
c) FSK d) QPSK
- (29) In cyclic redundancy check, what is the CRC?
a) the divisor b) the quotient
c) the dividend d) the remainder
- (30) VHF waves are used for some types of services because
a) of the low power required b) the transmitting antennas are of convenient size
c) they are very reliable d) they penetrate the ionosphere easily
- (31) Frequencies in the UHF range normally propagate by means of
a) ground waves b) sky waves
c) surface waves d) space waves
- (32) A solution to the 'blind speed' problem is
a) to change the Doppler frequency b) to vary the PRF
c) to use monopulse d) to use MTI
- (33) The glass tube of a TWT may be coated with aquadag to
a) help focusing b) provide attenuation
c) improve bunching d) increase gain
- (34) Maximum HF is reflected by

- a) D layer
c) F layer
- (35) Duplexer is used
a) to isolate transmitter and receiver
c) to isolate receiver and antenna
- (36) One of the microwave oscillator which has the negative resistance characteristic is
a) GUNN
c) Klystron
- (37) Isolator is used
a) to isolate antenna and receiver
c) to isolate antenna and transmitter
- (38) In T1 system the frame synchronization code repeats every
a) 125 μ s
c) 1.2 μ s
- (39) In FDM multiple signals
a) share a common channel bandwidth
c) use multiple path
- (40) A quantizer is used in
a) FDM
c) PCM
- (41) An analog multiplexing technique that combines analog signals is called
a) FDM
c) WDM
- (42) The modulation method that represents bits as different phase shifts of a carrier is
a) ASK
c) PSK
- (43) GSM system uses
a) GMSK
c) FSK
- (44) The CRC circuit is basically
a) decoder circuit
c) shift register circuit
- (45) Eye pattern is used to
a) reduce bandwidth
c) reduce ISI
- (46) If the SNR of the signal is increased, then the channel capacity
a) is increased
c) remains constant
- (47) Source coding in a data communication system is done in order to
a) enhance the information transmission rate
c) conserve the transmitted power
- (48) VLF propagation is possible for
a) ground wave propagation
- b) E layer
d) none of these
- b) to isolate transmitter and antenna
d) none of these
- b) IMPATT
d) all of these
- b) to isolate microwave source from reflection
d) to isolate microwave receiver from reflection
- b) 1.5 μ s
d) 150 μ s
- b) transmit at different time interval
d) modulate one another
- b) PM
d) AM
- b) TDM
d) PCM
- b) FSK
d) MSK
- b) ASK
d) DPSK
- b) multiplexer circuit
d) adder circuit
- b) increase bandwidth
d) amplify the signal
- b) is decreased
d) cannot be determined
- b) reduce transmission error
d) facilitate clock recovery in the receiver
- b) sky wave propagation

- c) space wave propagation
 (49) Tropospheric scatter is used with frequencies in the following range
 a) HF
 c) UHF
 (50) Signal upto 2 MHz are propagated as
 a) ground wave
 c) space wave
 (51) Signals from 2-30 MHz are propagated as
 a) ground wave
 c) space wave
 (52) The F₂- layer of the ionosphere extends from
 a) 90-140 km
 c) 250-400 km
 (53) The critical frequency and maximum value of electron density of the ionosphere are related by
 a) $f_c = 9N_{max}$
 c) $f_c = 9\sqrt{N_{max}}$
 (54) The critical frequency related to sky wave
 a) must be sent vertically upward
 c) must be sent at an angle other than 0° or 90°
 (55) To increase the maximum radar range by a factor of 2, the peak transmitted power is increased by a factor of
 a) 2
 c) 8
 (56) PPI is the abbreviated form of
 a) place position indicator
 c) plan position indicator
 (57) The remedy for the problem of "blind speed" is
 a) variation of pulse repetition frequency
 c) use of MTI
 (58) The sensitivity of a radar receiver is ultimately set by
 a) a high S/N ratio
 c) overall noise temperature
 (59) The resolution of pulse radars can be improved by
 a) increasing the pulse width
 c) increasing the pulse amplitude
 (60) The range of the radar can be increased by
 a) increasing peak transmitted pulse power
 c) increasing the frequency
- d) all of these
 b) VHF
 d) VLF
 b) sky wave
 d) none of these
 b) sky wave
 d) duct propagation
 b) 150-250 km
 d) 450-500 km
 b) $f_c = \sqrt{\frac{N_{max}}{9}}$
 d) $f_c = \frac{1}{9\sqrt{N_{max}}}$
 b) must be sent horizontally
 d) is a minimum frequency
 b) 4
 d) 16
 b) place position identification
 d) Plane position identification
 b) use of monopulse
 d) change in Doppler frequency
 b) a lower limit of signal power
 d) a high figure of merit
 b) decreasing pulse width
 d) decreasing the pulse repetition frequency
 b) increasing diameter of the antenna
 d) any one of these