



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.25 Min.

Full Marks : 70

[The figure in the margin indicates full marks.]

Group-A

(Multiple Choice Type Question)

1 x 70=70

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

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

(62) In multicavity klystron

- a) electrons are amplitude modulated
- c) electrons are velocity modulated

- b) electrons are frequency modulated
- d) electrons are phase modulated

(63) Travelling wave tube is a

- a) wide band microwave source
- c) single frequency microwave source

- b) narrow band microwave range
- d) wide band millimeter wave source

(64) The wavelength corresponds to microwave frequency range is

- a) 30 GHz to 300 GHz
- c) 3 GHz to 3 GHz

- b) 3 GHz to 30 GHz
- d) 300 GHz to 3000 GHz

(65) Double Drift Region (DDR) IMPATT diode is preferred to SDR IMPATT, because of

- a) lower noise
- c) higher speed of operation

- b) higher efficiency
- d) higher frequency range

(66) The role of the attenuator in a travelling wave tube is to

- a) helping bunching
- c) increase gain

- b) prevent oscillations
- d) prevent saturation

(67) In microwave frequency range, the most noisy semiconductor device is

- a) IMPATT
- c) GUNN

- b) TRAPATT
- d) TUNNEL

(68) Klystron can be used

- a) only as an amplifier
- c) as a phase shifter

- b) only as an oscillator
- d) both as an amplifier and oscillator

(69) A travelling wave tube (TWT) is basically

- a) an oscillator
- c) wideband amplifier

- b) tuned amplifier
- d) both amplifier and oscillator

(70) LSA diode differs from Gunn diode in the following respect

- a) it is a true diode
- c) it does not require negative resistance

- b) it prevents the formation of domain
- d) it need not be made of gallium arsenide