

Roll No.

D-975

**M. Sc. (Fourth Semester) (Main/ATKT)
EXAMINATION, May-June, 2020**

PHYSICS

Paper Fourth (B)

[Electronics—II (Communication)]*Time : Three Hours]**[Maximum Marks : 80***Note :** Attempt all Sections as directed.**Section—A**

1 each

(Objective/Multiple Choice Questions)**Note :** Attempt all questions.

Choose the correct answer :

1. The signals which are obtained by encoding each quantized signal into a digital word is called as :
 - (a) PAM signal
 - (b) PCM signal
 - (c) FM signal
 - (d) Sampling and quantization

2. A distorted signal of frequency f_m is recovered from a sampled signal if the sampling frequency f_s is :
 - (a) $f_s > 2f_m$
 - (b) $f_s < 2f_m$
 - (c) $f_s = 2f_m$
 - (d) $f_s \geq 2f_m$
3. Quantization is a process.
 - (a) Non-linear
 - (b) Reversible
 - (c) Non-linear and Reversible
 - (d) None of the mentioned
4. A frequency amplifier whose gain decreases from a finite value of to zero as the frequency of the sinusoidal input increases from d. c. to infinity is called :
 - (a) low pass filter
 - (b) high pass filter
 - (c) baud pass filter
 - (d) band pass filter
5. Delta modulation is conversion.
 - (a) Analog to digital
 - (b) Digital to analog
 - (c) Analog to digital and digital to analog
 - (d) None of the mentioned

P. T. O.

[3]

D-975

6. BPSK system modulates at the rate of :
- (a) 1 bit/symbol
 - (b) 2 bit/symbol
 - (c) 4 bit/symbol
 - (d) None of the above
7. The data rate of QPSK is of BPSK.
- (a) Thrice
 - (b) Four times
 - (c) Twice
 - (d) Same
8. In digital transmission, the modulation technique that requires minimum bandwidth is :
- (a) Delta modulation
 - (b) PCM
 - (c) DPCM
 - (d) PAM
9. How can power spectral density of non-periodic signal be calculated ?
- (a) By integrating
 - (b) By truncating
 - (c) By converting to periodic
 - (d) None of these

P. T. O.

[4]

D-975

10. Gaussian noise is referred to as :
- (a) Red noise
 - (b) Black noise
 - (c) White noise
 - (d) Normal noise
11. The noise voltage (V_n) and the signal bandwidth (B) are related as :
- (a) V_n is directly proportional to bandwidth
 - (b) V_n is directly proportional to $\sqrt{\text{bandwidth}}$
 - (c) V_n is inversely proportional to absolute temperature
 - (d) V_n is inversely proportional to bandwidth
12. What is the spectral density of white noise ?
- (a) varies with bandwidth
 - (b) varies with frequency
 - (c) constant
 - (d) infinite
13. Performance of BFSK signal is than BPSK.
- (a) 3 dB worse
 - (b) 3 dB better
 - (c) 6 dB worse
 - (d) 6 dB better

[5]

D-975

14. The non-coherent FSK needs E_b/N_0 than coherent FSK.
- (a) 1 dB more
 - (b) 1 dB less
 - (c) 3 dB more
 - (d) 3 dB less
15. Coherent PSK and non-coherent orthogonal FSK have a difference of in PB.
- (a) 1 dB
 - (b) 3 dB
 - (c) 4 dB
 - (d) 6 dB
16. Which of the following is not a linear modulation technique ?
- (a) OQPSK
 - (b) $\pi / 4$ QPSK
 - (c) FSK
 - (d) BPSK
17. Which of the following statements is true with respect to PCM ?
- (a) The parallel binary data is converted into serial before transmission.
 - (b) Analog data is transmitted directly.

P. T. O.

[6]

D-975

- (c) Analog signal is amplified before transmission.
 - (d) The analog signal is converted into parallel binary data before transmission.
18. Noise voltage V_n and absolute temperature T are related as :
- (a) $V_n = 1/\sqrt{(4RKTB)}$
 - (b) $V_n = \sqrt{(4RK)/(TB)}$
 - (c) $V_n = \sqrt{(4RKTB)}$
 - (d) $V_n = \sqrt{(4KTB)/R}$
19. Which causes a quantization noise in PCM system ?
- (a) Serial transmission error
 - (b) The approximation of quantized signal
 - (c) The synchronization between encoder and decoder
 - (d) Binary coding technique
20. Then digital modulation scheme in which the step size is not fixed is :
- (a) Delta modulation
 - (b) Adaptive delta modulation
 - (c) DPCM
 - (d) PCM

[7]

D-975

Section—B

2 each

(Very Short Answer Type Questions)

Note : Attempt all questions.

1. What is natural sampling ?
2. Define adaptive data modulation.
3. What is filtering ?
4. What is white noise ?
5. What is QASK ?
6. Explain output signal power.
7. What is noise bandwidth ?
8. What is flat top sampling ?

Section—C

3 each

(Short Answer Type Questions)

Note : Attempt all questions.

1. Explain signal to holding.
2. What is DPSK ?
3. Explain domain representation of noise.
4. Explain spectral component of noise.
5. Explain non-coherence detection on FSK.
6. Explain quantization noise in DM.
7. Explain mixing involving noise.
8. Explain quadrature component of noise.

P. T. O.

[8]

D-975

Section—D

5 each

(Long Answer Type Questions)

Note : Attempt all questions.

1. Explain sampling theorem with examples.
2. Explain quantization error with examples.
3. Compare DPSK, PSK and QASK.
4. Explain power spectral density of $n_c(t)$, $n_s(t)$ and their time derivatives.

D-975