

Roll No. ....

**E-985**

**M. Sc. (Fourth Semester) (Main/ATKT)  
EXAMINATION, May-June, 2021**

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 :

- The process of transmitting two or more information signals simultaneously over the same channel is called :
  - Multiplexing
  - Telemetry
  - Detection
  - Modulation

- Communication is the process of :
  - Keeping in touch
  - Broadcasting
  - Exchanging information
  - Entertainment by electronics
- Which of the following methods is employed in telephony ?
  - Time division multiplexing
  - Frequency division multiplexing
  - Both (a) and (b)
  - Only (a)
- The aperture effect in flat top pulses is reduced by using a/an .....
  - Predictor
  - Integrator
  - Equalizer
  - Compander
- The biggest disadvantages of PCM is :
  - its inability to handle analog signals
  - the high error rate which its quantizing noise introduces
  - its incompatibility with TDM
  - the large bandwidths that are required for it

**P. T. O.**

6. Quantizing noise occurs in :
- Time-division multiplexing
  - FDM
  - PCM
  - PWM
7. In PCM a system, the quantization noise depends upon :
- The number of quantization levels only
  - The sampling rate only
  - Both the sampling rate and the number of quantization levels
  - None of the above is correct
8. The quantization error in PCM system has :
- Gaussian distribution
  - Uniform distribution
  - Poisson's distribution
  - None of the above
9. Comparison of MSK and QPSK schemes, show that :
- MSK requires less power
  - QPSK requires less power
  - Filtering is simple in MSK
  - No comparison

P. T. O.

10. For coherent FSK system, the bit error probability is given by :

- $\frac{1}{2} \operatorname{erfc} \left( \frac{\sqrt{E_b}}{4N_0} \right)$
- $\frac{1}{2} \operatorname{erfc} \left( \frac{\sqrt{E_b}}{N_0} \right)$
- $\frac{1}{2} \operatorname{erfc} \left( \frac{\sqrt{E_b}}{2N_0} \right)$
- $\operatorname{erfc} \left( \frac{\sqrt{E_b}}{4N_0} \right)$

11. .... is most affected by noise.

- PSK
- ASK
- FSK
- DPSK

12. For a BPSK scheme, the bit error probability is given by :

- $\frac{1}{2} \operatorname{erfc} \left( \sqrt{\frac{E_b}{2N_0}} \right)$

- (b)  $\frac{1}{2} \operatorname{erfc} \left( \sqrt{\frac{E_b}{N_0}} \right)$
- (c)  $\frac{1}{2} \operatorname{erfc} \left( \frac{1}{2} \sqrt{\frac{E_b}{2N_0}} \right)$
- (d)  $\frac{1}{2} \operatorname{erfc} \left( \frac{1}{2} \sqrt{\frac{E_b}{N_0}} \right)$

13. The channel capacity of a 5 kHz bandwidth binary system is :

- (a) 10000 bits/sec
- (b) 5000 bits/sec
- (c) 8000 bits/sec
- (d) 4000 bits/sec

14. ASK and PSK is which type of modulation ?

- (a) Analog modulation
- (b) Digital modulation
- (c) Both (a) and (b)
- (d) None of the above

15. Arrange in increasing order of null-to-null bandwidth (Hz) of the following binary bandpass signals :

- (1) QPSK
- (2) MSK
- (3) FSK
- (4) ASK

**Codes :**

- (a) 1, 2, 4, 3

- (b) 4, 3, 2, 1
- (c) 2, 4, 1, 3
- (d) 3, 2, 4, 1

16. In which modulation technique does the phase of the carrier signal is changed by varying the sine and cosine inputs at a particular time ?

- (a) Frequency modulation
- (b) Phase shift key modulation
- (c) Analog modulation
- (d) Pulse code modulation

17. If the number of bits per sample in a PCM is increased from 8 to 16, then the bandwidth will be increased by :

- (a) 2 times
- (b) 4 times
- (c) 8 times
- (d) 16 times

18. Bandwidth of an N-bit binary coded PCM signal for modulation a signal sampled at 'f' Hz is :

- (a)  $f/N$  Hz
- (b)  $f/N^2$  Hz
- (c)  $Nf$  Hz
- (d)  $N^2f$  Hz

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19. The minimum channel bandwidth required for a PAM-TDM system to avoid crosstalk is .....

- (a) 2 NB
- (b) NB
- (c) NB/2
- (d) NB/4

20. Which of the following has the least noise immunity ?

- (a) QAM
- (b) ASK
- (c) FSK
- (d) PSK

**Section—B**

2 each

**(Very Short Answer Type Questions)**

**Note :** Attempt all questions.

1. What is filtering ?
2. What is sampling ?
3. Why is PAM not used in practice ?
4. Write the expression for minimum error probability of matched filter.
5. What are the advantages of QPSK system ?
6. What is QASK ?
7. What is the bandwidth of a PCM System ?

**P. T. O.**

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8. What is the relation between number of quantization levels and the number of digits per word ?

**Section—C**

3 each

**(Short Answer Type Questions)**

**Note :** Attempt all questions.

1. What are the basic components of the communication systems ?
2. Define the sampling process and its necessary in communication system.
3. What are the disadvantages of PCM ?
4. What is transmission bandwidth of PAM ?
5. Draw the block diagram of QPSK.
6. What is meant by noise ?
7. What is meant by quadrature modulation ?
8. Explain various PAM digital formats.

**Section—D**

5 each

**(Long Answer Type Questions)**

**Note :** Attempt all questions.

1. Express the BPSK signal mathematically.
2. Define PAM and explain its generation and detection.
3. Explain the ASK system and derive the relation for error probability of binary ASK.
4. Discuss the terms FSK, PSK and DPSK.

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