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Brainware University
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BRAINWARE UNIVERSITY

Term End Examination 2025-2026

Programme – B.Sc.(ANCS)-Hons-2023/B.Sc.(ANCS)-Hons-2024/B.Sc.(ANCS)-Hons-2025

Course Name – Communication Fundamentals

Course Code - BNC20001

(Semester II)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

(i) In a communications system, select from the following that noise is most likely to affect the signal.

- | | |
|------------------------------|-----------------------|
| a) at the transmitter | b) in the channel |
| c) in the information source | d) at the destination |

(ii) Which of the following modulated signals can be detected by an envelop detector?

- | | |
|-----------|-----------|
| a) DSB-SC | b) DSB-FC |
| c) FM | d) SSB-SC |

(iii) Define one of the drawbacks of FM signal.

- | | |
|------------------------|------------------|
| a) high noise | b) limited range |
| c) low signal strength | d) none of these |

(iv) In generation of modulated signal, identify a varactor diode can be used for_____.

- | | |
|-----------------------|------------------------------|
| a) FM generation only | b) AM generation only |
| c) PM generation only | d) both AM and PM generation |

(v) Identify the most common modulation system used for telegraphy is_____.

- | | |
|---------------------------|---------------------------|
| a) frequency-shift keying | b) two-tone modulation |
| c) pulse-code modulation | d) single-tone modulation |

(vi) If f_m is the modulating frequency of an AM wave, from the following select the sideband frequencies of this wave.

- | | |
|-----------------------|-------------------|
| a) greater than f_m | b) equal to f_m |
| c) less than f_m | d) none of these |

(vii) Select the reason of using Amplitude modulation in broadcasting.

- a) it is more noise immune than other modulation systems.
 - b) Compared with other systems it requires less transmitting power
 - c) its use avoids receiver complexity.
 - d) no other modulation system can provide the necessary bandwidth for high fidelity
- (viii) Select the use of Ring modulator.
- a) generating SSB-SC signal
 - b) generating DSB-FC signal
 - c) generating DSB-SC signal
 - d) none of these
- (ix) Identify the use of Vestigial side-band modulation.
- a) HF point-to-point communications
 - b) monoaural broadcasting
 - c) TV broadcasting
 - d) stereo broadcasting
- (x) Which of the following is considered as an AM signal?
- a) BPSK
 - b) DPSK
 - c) Differential encoded PSK
 - d) QPSK
- (xi) Give example in the VSB system-
- a) picture and sound carrier are transmitted
 - b) only sound carrier is transmitted
 - c) only picture carrier is transmitted
 - d) none of these
- (xii) Select the analog system from following.
- a) PCM
 - b) PAM
 - c) DPCM
 - d) DM
- (xiii) Identify that the DSB-SC signal consists of _____.
- a) two sidebands and carrier
 - b) two sidebands
 - c) one sideband and carrier
 - d) one sideband
- (xiv) Indicate data transmitted for a given amount of time is called
- a) Noise
 - b) Power
 - c) Frequency
 - d) Bandwidth
- (xv) Medium which sends information from source to receiver is called _____.
- a) Transmitter
 - b) Transducer
 - c) Loudspeaker
 - d) Channel

Group-B

(Short Answer Type Questions)

3 x 5=15

2. A modulating signal $10 \sin(2\pi \times 10^3 t)$ and a carrier signal $15 \sin(2\pi \times 10^5 t)$ are used for amplitude modulation. Determine the modulation index, carrier power and total power. (3)
3. What are the different kinds of AM? (3)
4. State Sampling theorem. Explain aliasing effect and how it is reduced. (3)
5. Draw the waveforms at input and output of an envelope detector. (3)
6. Compare AM with DSB-SC and SSB-SC. (3)

OR

State and explain Carson's rule.

(3)

Group-C

7. With the help of block diagrams explain the transmitter and receiver of pulse code modulation. (5)
8. Distinguish between analog communication and digital communication systems. (5)
9. With the net block diagram explain the principle of SSB-SC generation by phase shift method. (5)
10. Derive the relations for sampling rate and transmission bandwidth in PCM system. (5)
11. With necessary block diagram explain generation and detection of BASK signal. (5)
12. Summarize the need for modulation in communication systems. (5)

OR

Draw the block diagram of communication system and explain the function of each block. (5)

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