

Linguistics and Cosmic Communication

Linguistics · Answer Key · 25 Questions

1. Which prime number-based mathematical sequence was included on the Arecibo message to demonstrate the universality of logic for potential extraterrestrial decoders?

- A) The Fibonacci sequence
- B) The Mersenne primes
- C) The first 23 prime numbers**
- D) The sequence of atomic numbers

2. The 'Voyager Golden Record' features greetings in 55 languages. Which ancient language, no longer spoken natively, was included to represent the Indo-European family?

- A) Sumerian
- B) Latin
- C) Ancient Greek
- D) Sanskrit**

3. What is the primary linguistic challenge in the 'Lincos' (Lingua Cosmica) system designed by Hans Freudenthal?

- A) Translating idiomatic metaphors
- B) Defining basic logical operators without prior vocabulary**
- C) Handling phonemic variations in alien biology
- D) Encoding grammar for non-linear time perception

4. In the context of the SETI protocol, what is the 'Distant Signal' linguistic concern regarding the speed of light?

- A) Phonetic shifts over light-years
- B) The degradation of Morse code
- C) The temporal delay making synchronous dialogue impossible**
- D) The necessity of using tonal languages only

5. The Lincos project relies on which branch of linguistics to bridge the gap between human language and universal logic?

- A) Sociolinguistics
- B) Semantics**
- C) Morphology
- D) Pragmatics

6. Which linguistic concept suggests that the structure of a language affects its speakers' world view, a key concern in astrolinguistics?

A) The Sapir-Whorf hypothesis

- B) Noam Chomsky's Universal Grammar
- C) Grice's Maxims
- D) The Great Vowel Shift

7. NASA's Pioneer plaques included a drawing of a man and a woman. What linguistic or semiotic problem does this representation face?

- A) The direction of the hand wave
- B) The lack of a reference scale

C) The anthropocentric bias of the gesture

- D) The use of binary color coding

8. What is the 'Great Silence' in the context of the Fermi Paradox as discussed by linguists interested in SETI?

A) The lack of detectable radio signatures

- B) The inability to decipher alien syntax
- C) The vacuum of space blocking sound waves
- D) The absence of universal grammar in nature

9. Which form of 'language' was chosen for the Voyager record to represent universal physical constants rather than human speech?

- A) Binary code
- B) Music notation

C) Mathematical harmonics

- D) Pictographic sequences

10. In astrolinguistics, what is meant by 'semantic universality'?

- A) Languages that contain all possible words

B) Concepts that are thought to be common to all intelligent life, like geometry

- C) The ability for one language to translate all others
- D) The evolution of language from a single cosmic source

11. What is the primary function of 'METI' (Messaging Extraterrestrial Intelligence) from a linguistic perspective?

- A) Decoding passive signals

B) Proactive signal transmission

- C) Analyzing cosmic background noise
- D) Linguistic archaeology of Earth

12. Why is the 'Wow! signal' considered a linguistic challenge?

- A) It contained clear syntax
- B) It was a non-repeating, narrow-band signal of unknown origin**
- C) It was transmitted in a known Earth dialect
- D) It required a decryption key based on Prime numbers

13. Which linguistic category would describe an alien communication that relies entirely on sequences of light pulses?

- A) Visual-sign language
- B) Bioluminescent code
- C) Optical-kinetic linguistics
- D) Signal-based semiotics**

14. What is the 'Baudot code' mentioned in early SETI discussions?

- A) An early teleprinter character set**
- B) A system for translating binary into syntax
- C) A method for phoneme analysis
- D) The base language for Lincos

15. The 1974 Arecibo message was composed of 1,679 bits. Why was this specific number chosen?

- A) It is the age of the solar system
- B) It is a semiprime number (23 x 73)**
- C) It matches the number of elements in the periodic table
- D) It correlates to the speed of radio waves

16. What is the main critique of using human grammar as a template for extraterrestrial communication?

- A) It is too simple
- B) It is bound to terrestrial biological and evolutionary history**
- C) It relies on high-frequency audio
- D) It is too complex for basic transmission

17. In linguistics, what is 'xenolinguistics'?

- A) The study of extinct languages
- B) The theoretical study of alien language structures**
- C) The study of sign language in deep sea creatures
- D) The evolution of languages in isolated environments

18. What does the term 'syntax' refer to in the context of designing an interstellar message?

- A) The tone of the greeting
- B) The rules governing the arrangement of symbols**
- C) The physical medium of the signal
- D) The speed of transmission

19. Which physical property of atoms was proposed as a 'universal dictionary' to define linguistic symbols in interstellar messaging?

- A) The mass of a hydrogen atom
- B) The spin-flip transition of neutral hydrogen**
- C) The radioactive decay of uranium
- D) The melting point of iron

20. Why are pictographs often preferred over phonological symbols in early interstellar contact attempts?

- A) They are easier to broadcast
- B) They do not require knowledge of an Earth-based language's sound system**
- C) They are more grammatically complex
- D) They represent the future of human language

21. How do linguists define 'arbitrariness' in language, a concept central to the difficulty of space communication?

- A) The lack of a necessary connection between a sign and its meaning**
- B) The random nature of receiving signals
- C) The intentional obfuscation of data
- D) The speed at which languages evolve

22. What role does 'recursion' play in theories about potential alien language capabilities?

- A) It prevents signal decay
- B) It allows for the creation of infinite sentences from finite rules**
- C) It limits the vocabulary size
- D) It determines the direction of the signal

23. Which concept in linguistics refers to the 'minimal unit of meaning' that researchers hope to find in extraterrestrial signals?

- A) Phoneme
- B) Morpheme**
- C) Grapheme
- D) Lexeme

24. What is the main purpose of the 'Drake Equation' in the context of communication studies?

- A) To calculate the energy required for signal transmission
- B) To estimate the number of active, communicative civilizations**
- C) To measure the linguistic entropy of a signal
- D) To map the syntax of planetary orbits

25. In cosmic communication theory, what is 'signal redundancy'?

- A) The intentional repetition of information to ensure successful decoding**
- B) The overflow of data in a message
- C) The useless noise in a transmission
- D) The requirement for two different languages in one message