

## QUESTION 2

3. What two common data structures were included in Plankalkül?

- Plankalkül included arrays and records (or structures) as common data structures.

5. Why was the slowness of interpretation of programs acceptable in the early 1950s?

- In the early 1950s, computers were primarily used for scientific and engineering calculations, where the speed of program execution was less critical than the ability to perform complex computations at all. Additionally, the cost of hardware was so high that the inefficiency of interpretation was a secondary concern compared to the benefits of easier program development and debugging.

6. What hardware capability that first appeared in the IBM 704 computer strongly affected the evolution of programming languages? Explain why.

- The IBM 704 introduced floating-point hardware, which allowed for efficient handling of real numbers. This capability strongly influenced the development of programming languages like Fortran, which were designed for scientific and engineering computations requiring floating-point arithmetic.

7. In what year was the Fortran design project begun?

- The Fortran design project began in 1954.

8. What was the primary application area of computers at the time Fortran was designed?

- The primary application area was scientific and engineering computations.

9. What was the source of all of the control flow statements of Fortran I?

- The control flow statements in Fortran I were based on the IBM 704's machine language instructions.

10. What was the most significant feature added to Fortran I to get Fortran II?

- The most significant feature added to Fortran II was support for subroutines and functions, which allowed for modular programming.

11. What control flow statements were added to Fortran IV to get Fortran 77?

- IF-THEN-ELSE
- DO loops with END DO
- CASE statements

14. Why were linguists interested in artificial intelligence in the late 1950s?

- Linguists were interested in artificial intelligence because they wanted to develop systems capable of natural language processing and machine translation, which required understanding and simulating human language.

15. Where was Lisp developed? By whom?

- Lisp was developed at MIT by John McCarthy.

20. What missing language element of ALGOL 60 damaged its chances for widespread use?

- ALGOL 60 lacked input/output facilities, which made it less practical for many real-world applications.

21. What language was designed to describe the syntax of ALGOL 60?

- The Backus-Naur Form (BNF) was designed to describe the syntax of ALGOL 60.

22. On what programming language was COBOL based?

- COBOL was based on the FLOW-MATIC language.

23. In what year did the COBOL design process begin?

- The COBOL design process began in 1959.

24. What data structure that appeared in COBOL originated with Plankalkül?

- The record (or structure) data structure in COBOL originated with Plankalkül.

25. What organization was most responsible for the early success of COBOL (in terms of extent of use)?

- The U.S. Department of Defense was most responsible for the early success of COBOL, as it mandated its use for military and government applications.

36. What is a nonprocedural language?

- A nonprocedural language is one in which programs specify what is to be done rather than how to do it. Examples include SQL and Prolog.

37. What are the two kinds of statements that populate a Prolog database?

- Facts: Statements that are unconditionally true.
- Rules: Conditional statements that define relationships between facts.

46. What was the first application for Java?

- The first application for Java was embedded systems, particularly for consumer electronics like set-top boxes and handheld devices.

51. For what application area is JavaScript most widely used?

- It is most widely used for client-side web development, enabling dynamic and interactive web pages.

52. What is the relationship between JavaScript and PHP, in terms of their use?

- JavaScript is primarily used for client-side scripting in web browsers, while PHP is used for server-side scripting to generate dynamic web content. They often work together in web development.

57. What deficiency of the switch statement of C is addressed with the changes made by C# to that statement?

-C# addressed the fall-through behavior of the C switch statement by requiring an explicit break or return to prevent accidental execution of multiple cases.

59. What are the inputs to an XSLT processor?

- An XML document (the source data).
- An XSLT stylesheet (the transformation rules).

60. What is the output of an XSLT processor?

- The output of an XSLT processor is typically a transformed XML document, which could also be HTML, plain text, or another format, depending on the stylesheet.