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

They are : Arrays and Records

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

The slowness of interpretation was acceptable in the early 1950s because computing was still in its early stages, and hardware was expensive. Programmers focused more on getting programs to run correctly rather than optimizing speed, as computers were mainly used for scientific and military applications where accuracy was prioritized over efficiency.

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

The IBM 704 introduced hardware support for floating-point arithmetic, which greatly impacted programming languages. This feature enabled efficient mathematical computations, leading to the development of high-level languages like FORTRAN. FORTRAN made programming easier and more accessible by allowing users to write code in a structured and human-readable format while still achieving efficient execution.

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

Fortran 77 introduced new control flow statements that improved program structure and readability. These included:

IF-THEN-ELSE: Allowed structured conditional branching instead of using only arithmetic IF statements.

DO-ENDDO Loops: Provided a more structured way to write loops without requiring labeled statements.

BLOCK IF: Introduced multiple conditional branches using ELSE IF for better program logic.

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

Linguists became interested in artificial intelligence in the late 1950s because they saw AI as a way to model human language processing and automate translation. At the time, there was significant interest in machine translation of languages, particularly for Cold War-era intelligence and communication. Researchers believed AI could help analyze syntax, semantics, and linguistic structures, leading to advancements in computational linguistics and natural language processing.

6. Where was Lisp developed? By whom?

Lisp was developed at MIT (Massachusetts Institute of Technology) by John McCarthy in 1958.

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

The missing language element of ALGOL 60 that damaged its chances for widespread use was the lack of **input/output (I/O) facilities**, which made it difficult to use for practical applications outside of academic environments.

8. 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 adopted the language for its data processing needs, leading to widespread use in government and business applications.

9. What is a nonprocedural language?

A **nonprocedural language** is a programming language that focuses on **what** needs to be done rather than **how** to do it. It allows the programmer to specify the desired result without detailing the steps to achieve it. Examples include **SQL** for database queries and **Prolog** for logic programming.

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

The two kinds of statements that populate a Prolog database are:

Facts – Represent basic assertions or information about the world (e.g., father(john, jim).).

Rules – Define relationships between facts using logical conditions (e.g., grandfather(X, Y) :- father(X, Z), father(Z, Y).).

11. What was the first application for Java?

The first application for Java was interactive television. Java was initially developed by Sun Microsystems in the mid-1990s under the name Oak for use in embedded systems, particularly for controlling set-top boxes and interactive TV devices. It was later renamed Java and became widely popular for its platform independence.

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

avaScript is most widely used for **web development**, particularly for creating **interactive and dynamic content** on websites. It runs in web browsers and is essential for client-side scripting, handling user interactions, animations, and form validations.

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

JavaScript is used for client-side scripting, running in the user's browser to enhance user interfaces, while PHP is used for server-side scripting, running on the web server to process data, manage databases, and generate dynamic web pages. They are often used together to create interactive web applications, with JavaScript handling the frontend and PHP handling the backend.

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

The deficiency of the switch statement in C that is addressed by C# is the lack of support for string values and fall-through prevention.

String support: In C, switch can only handle integer values, whereas C# allows switch to work with strings.

Fall-through prevention: In C, case labels in switch statements can "fall through" to the next case unless explicitly handled, which can lead to errors. C# prevents this fall-through by requiring each case to either end with a break, return, or throw, ensuring clearer and safer control flow.

15. What are the inputs to an XSLT processor?

The inputs to an XSLT processor are:

XML document – The source XML data that needs to be transformed.

XSLT stylesheet – The stylesheet (written in XSLT) that defines the transformation rules and logic for transforming the XML document.

16. What is the output of an XSLT processor?

The output of an XSLT processor is typically a transformed XML document or other formats like HTML, text, or JSON, depending on the instructions in the XSLT stylesheet