A **programming language** is used by programmers to write instructions for computers and on the basis of these instructions a computer performs various tasks/operations.

There are two broad categories of programming languages:

1. **Low Level Programming Languages**
2. **High Level Programming Languages**

**Low Level Programming Languages**

Low-level languages are closer to the hardware while really difficult for humans to understand. There are two types of low level programming languages:

1. **Machine Language/Code**
2. **Assembly Language**

**Machine Language/Code**

Machine language is the lowest level programming language. It is the only language understood by computers directly. While easily understood by computers, machine languages are almost impossible for humans to use because they consist entirely of binary numbers only. For example 11010010, 11001111 etc. are different machine code commands.

**Assembly Language**

An assembly language is made up of a reasonably small set of command words called 'Mnemonics'. Now this is much friendlier than machine code. For instance the MOV command moves data from one location to another. The ADD command carries out an add operation.

Unlike machine code, processor cannot understand assembly language directly. To overcome this issue, a software is used which converts the assembly instructions back into machine code and this software is called as assembler.

**High Level Programming Languages**

High-level programming languages are closer to human languages which means human can understand them easily while it is really difficult for a computer to understand high level programming languages directly. Due to this reason compiler or interpreter are used to convert high level language code into machine code which can be understood by a processor easily. The main purpose of a compiler and interpreter is same but their back end functionality is different. Take a look at basic differences in between these two translators:
The input code to an assembler or a compiler is called as source code while the output code of an assembler or a compiler is called as an object code (obj code).

<table>
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<tr>
<th>No</th>
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<th>Interpreter</th>
</tr>
</thead>
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<td>Interpreter Takes <strong>Single</strong> instruction as input</td>
</tr>
<tr>
<td>2</td>
<td>Intermediate Object Code is Generated</td>
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</tr>
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<td><strong>Example : C Compiler</strong></td>
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Examples of high level programming language are JAVA, C, C++, VB.NET, PYTHON, C# and so on.

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**Question 1:** (Specimen Paper 2015, P1, Q12)

Look at these two pieces of code:

A:
```
CLC
LDX #0
loop: LDA A,X
ADCA B,X
STAC,X
INX
CPX #16
BNE loop
```

B:
```
FOR Loop = 1 TO 4
INPUT Number1, Number2
Sum = Number1 + Number2
PRINT Sum
NEXT
```

(a) Which of these pieces of code is written in a high-level language?
(b) Give one benefit of writing code in a high-level language.

(c) Give one benefit of writing code in a low-level language.

(d) High-level languages can be compiled or interpreted.

Give two differences between a compiler and an interpreter.

1  

2  