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BRANCH => I.T.

SUBJECT => PRINCIPLE OF SOFTWARE SYSTEM

"UNIT-1"

"System software & Language Processors & Software tools"

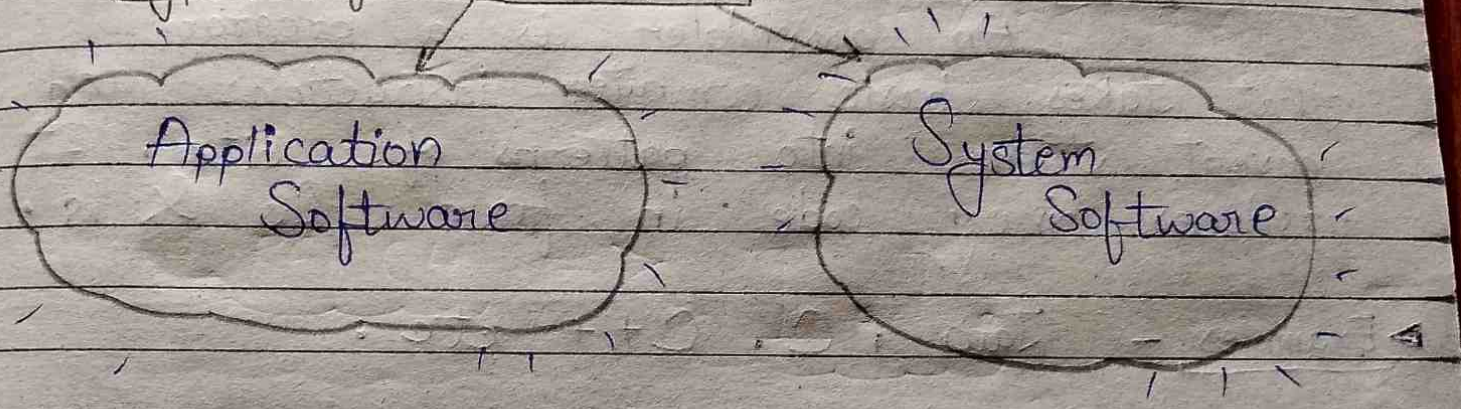
Date:

★ BASIC QUESTIONS :-

Que.1 Define Software & its types ?

Ans-1] Software is a set of instructions, data or program used to ~~execute~~ operate computer & execute specific tasks.

★ Types of SOFTWARE :-



Que.2 What are the various applications of software ?

Ans-2] A collection of microsoft software including, MS office, powerpoint, word, Excel & outlook.

Common internet browser like google chrome, safari, firefox etc.

Graphics & designing software such as Canva, Adobe Photoshop.

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Que.3 Differentiate b/w Compiler, Assembler & interpreter.

Ans-3) Compiler -

Basically, compiler is used to translate high level programming language into machine language, it execute the entire code.

- Assembler -

An assembler is a program that takes basic computer instructions and convert them into patterns of bits. It produces binary code in form 0s & 1s.

▶ Examples - Java, C, C++ etc.

- Interpreter -

An interpreter is a program that directly executes the instructions in a high-level language, without converting it into machine code. It translate the code line by line.

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Que. 4 Differentiate b/w program & software?

Ans-4] Program

① A program is a set of instruction that a computer can run, that process input and output a result.

② Programs are mainly dependent on compiler.

③ There are no such categories of program.

④ Ex. → of program includes Web browsers, video games etc.

Software

① Software is a set of instructions, data or program used to operate computers & execute specific tasks.

② Software's are mainly dependent on operating system.

③ Various categories of software system includes Application & System software etc.

④ Examples of software include Adobe photoshop, Google Chrome, powerpoint etc.

Que. 5 What do you mean by Application & system software.

Ans-5] Application Software -

Application software refers to a type of computer software designed to perform specific tasks or functions for end-users. Application software can be developed for different operating system including windows, macOS, linux etc.

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Ex.- Application software include Microsoft Word, Adobe photoshop, Google chrome etc.

② System Software :-

System software is a type of computer program that is designed to run a computer's hardware & application programs.

Ex.- macOS, linux, Microsoft Window, Google drive etc.

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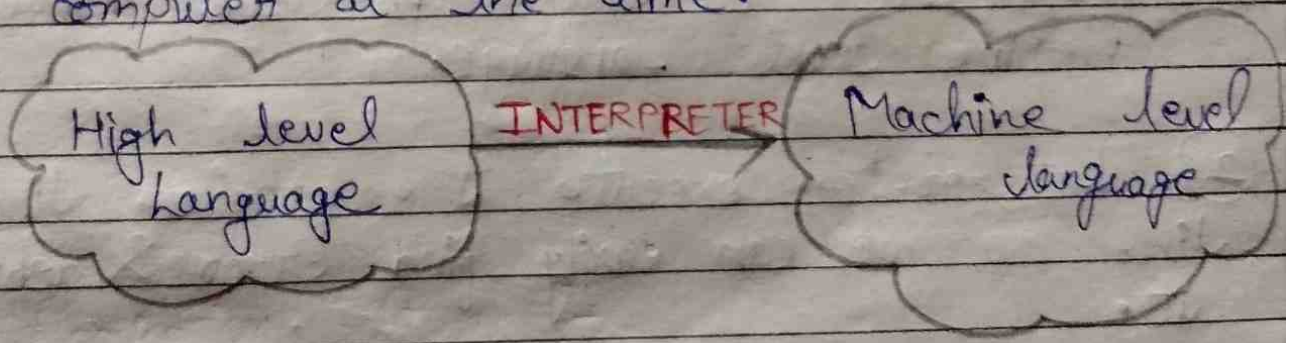
★ Interpreter, Assembler and Compiler :-

• Interpreter -

All high level languages need to be converted to machine code so that the computer can understand the program after taking the required inputs. The software by which the conversion of high level instructions is performed line by line to machine level language other than the compiler and assembler is known as the interpreter. If an error is found on any line the execution stops till its corrected. This process of correcting errors is easier as it gives line by line error but the program takes more time to execute sucessfully.

Interpreter was first used in year 1952 to ease programming within the limitations of computer at the time.



★ Need of an interpreter :-

The first and important need of an interpreter is to translate source code from high level language to machine language. However, for this purpose

compiler is also there to satisfy this condition. Compiler is a powerful tool for developing programs but there are several disadvantages associated with the compiler. If the source code is huge in size then it takes several hours to compile the source code which will significantly increases the compilation duration, then interpreter play its role they can cut this huge compilation duration. they are designed to translate single instruction at a time and execute immediately.

★ Advantages & Disadvantages of interpreter -

• Advantages -

(1) Interpreter converts high-level language to machine level language.

(2) Interpreter execute the program line by line so we can easily find error & debuged it.

(3) Interpreter works as a interphase b/w Computer hardware & user.

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• Disadvantages :-

(1) Interpreter execute the program, so it take more time duration.

(2) Slower Execution :-
Since an interpreter translate and executes the code line-by-line, it can be slower than compiled code.

(3) Lack of optimization :-
Interpreter do not perform the same level of optimization as compiler do.

★ Differentiate b/w Interpreter, Compiler & Assembler

Ans-1)

Parameter	Assembler	Compiler	Interpreter
Conversion	① It converts program written in assembly lang. to machine lang.	① It converts high-level program into machine lang.	① It also converts the program developed code into machine-level lang.
Scanning	② It converts the source code into the object code then converts into the machine code	② It scan the entire program before converting it into the binary code.	② It translate the code line by line to the machine code.
Error detection	③ It detects error in the first phase after fixation, the 2nd phase start.	③ Gives the full error report after the whole scan.	③ Detects error line by line, & stop the scanning until the error in the previous line is solved.
Execution Time	④ It also takes more time than the compiler.	④ It takes less execution time comparing to an interpreter.	④ It takes more execution time than the compiler.

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Examples			
Python, pHp, Ruby	C, C++, Java	Gas, GNU (Gas Natural Vehicular)	

Que.1 Define Compiler. What are the various advantages & Disadvantages of compiler.

Que.2 Define Interpreter, also define various type of interpreter.

Que.3 What are various advantages & ~~distange~~ disadvan. of interp.

Que.4 What do you mean by assembler.

Ans-1) Compiler - Compiler converts programming lang. into machine lang. It execute the entire code. It takes very less time as compare to interpreter & assembler.

- Advantages of Compiler

(1) It takes less time for execution.

(2) It converts high-level programm. lang. into machine lang.

- Disadvantages of Compiler:-

(1) It ~~converts~~ execute entire code then in the end it gives the error.

(2) Compiled code can be more difficult to modify or update than interpreted code.

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Ans-2) Interpreter :-

Interpreter execute the code line by line, it do not execute the entire code. but it gives error faster then compiler. It converts the developed code into machine code.

- Types :- ① Bytecode interpreter ② Threaded interpreter ③ Self interpreter ④ Abstract syntax tree interpreter ⑤ Pure / Impure interpreter.

Ans-3) Advantages of interpreter :-

① It gives error faster, so we can correct quickly.

② It execute the code line by line.

- Disadvantages of interpreter :-

① It takes more time for execution.
② It do not execute the entire code at a time

Ans-4) Assembler :-

Assembler converts the assembly language into machine language. It take more time than compiler. It convert the source code into object code then converts into machine code.

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★ Types of Compilier :-

There are different types of compilers :-

1. Cross Compiler
2. Bootstrap Compiler
3. Decompiler
4. Trans.-compiler.
5. Single pass compiler
6. Multi-pass compiler
7. Incremental Compiler.
8. Traditional compilers.

★ Types of interpreter used in programming :-

1. Bytecode interpreter
2. Threaded code interpreter
3. Self interpreter
4. Abstract syntax tree interpreter
5. Pure / Impure Interpreter.

★ Types of Assembler :-

1. Single pass assembler
2. Multi pass assembler

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★ Types of Assemblers:-

① Single Pass Assembler:-

In single pass assembler the whole conversion of assembly code into machine code in one go.

② Multi-Pass Assembler:-

In multi-pass assembler the first process the assembly code & store the value into a table then in second phase. They generate the machine code by using these tables.

• Type of Compiler:-

① Cross Compiler:-

The compiled program can run on a computer whose C.P.U or operating system is different from the one on which the compiler run.

② Bootstrap Compiler:-

The compiler return in the lang. that it intends to compiler.

③ Decompiler:-

That translate the compiler that translate from a low-level language to high level language.

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④ Transcompiler :-

A trans-compiler, or a source-to-source compiler, is a program that translates source code written in one programming language to equivalent source code written in another programming language.

⑤ Single-pass Compiler :-

A single-pass compiler is a type of compiler that reads the source code of a program & generates machine code in a single pass (OR) one go.

⑥ Multi-pass compiler :-

A multi-pass compiler is a type of compiler that reads the source code of a program multiple times, in several passes (or) iterations.

⑦ Incremental Compiler :-

Incremental Compiler is a compiler, which executes the recompilation of only a changed source instead of compiling the complete source code.

⑧ Traditional Compiler :- A traditional compiler is a program that translates source code written in a high level programming language into machine code.

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Traditional compiler are widely used for creating software applications, operating systems, and embedded system.

UNIT-II "ASSEMBLERS"

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★ Elements of assembly language programming -

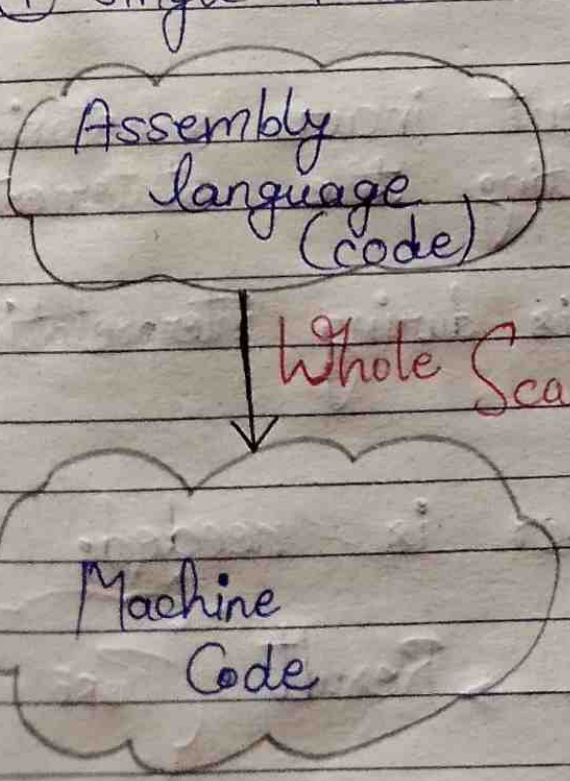
Ans-1 There are various element of assembly language programming -

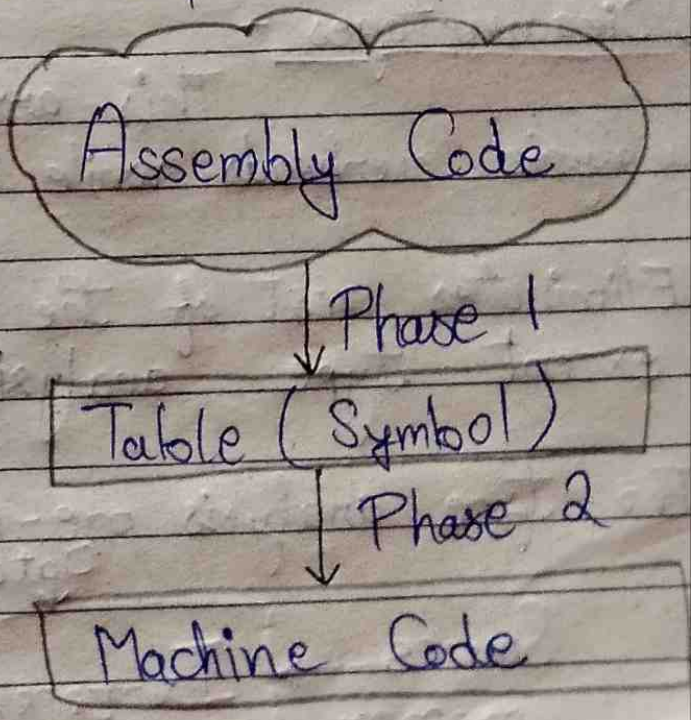
1. Label
2. Syntax
3. Commands
4. Statements
5. Operands
6. Directive macros
7. Comments
8. Orders
9. Symbols
10.

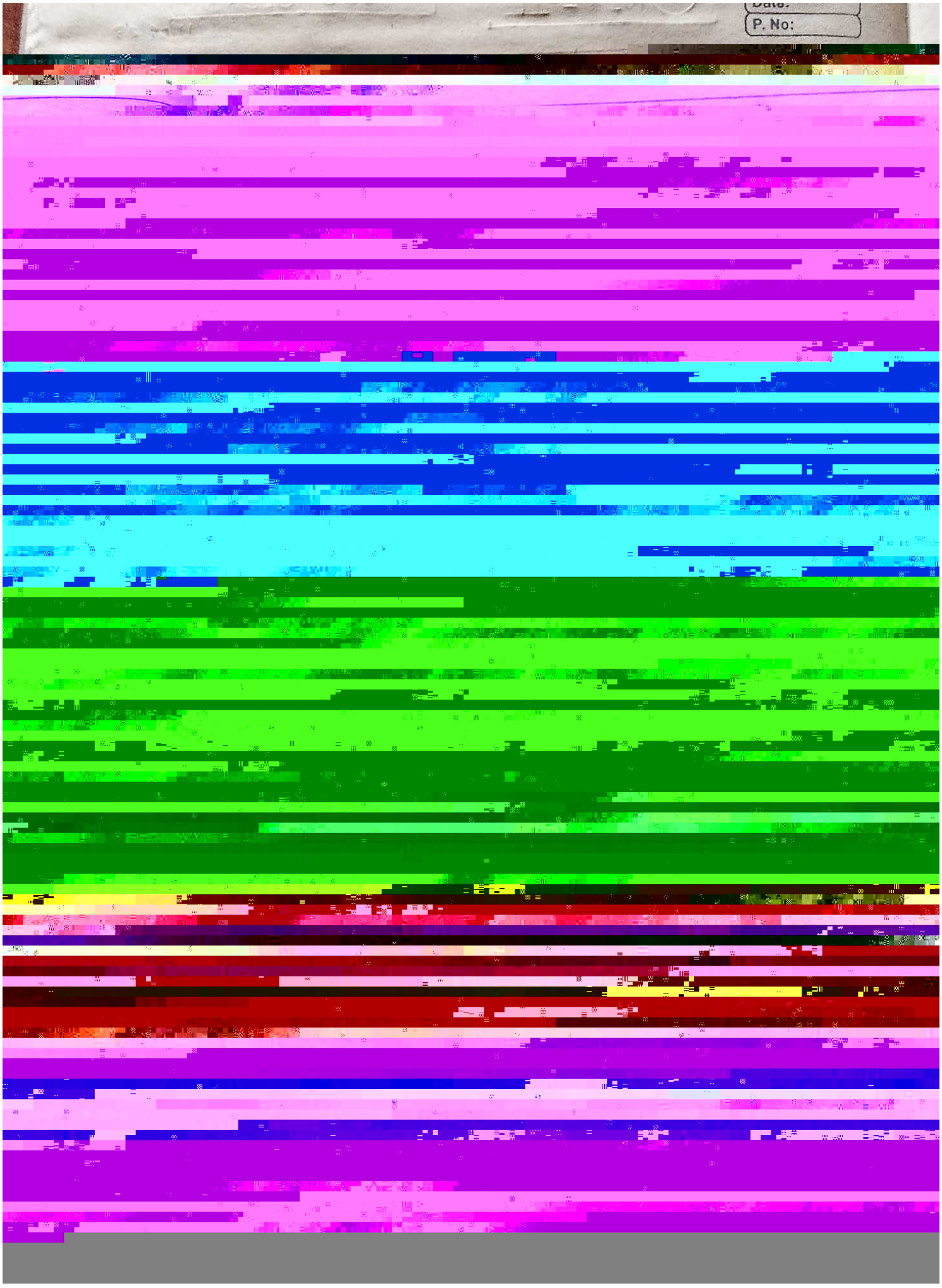
★ Pass structure of Assembler -

Ans-1 So these are 2 types of pass structure in assembler -

1. Single Pass
2. Multipass structure.



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★ Impure interpreter :-

Performs some preliminary processing of the source program to reduce analysis overhead during interpretation.

(1) Preprocessor convert program to an IR which is used during interpretation.

(2) IC can be analysed more efficiently then source program.

(3) Thus, speed up interpretation

(4) Disadvantage :-

Use of IR implies the entire program has to be pre-processed after any modifications.

(5) Thus, incurs fixed overhead at the start of interpretation.

(6) Conclusion statement :- Thus, eliminates most of the analysis during interpretation