Terna Engineering College

Computer Engineering Department

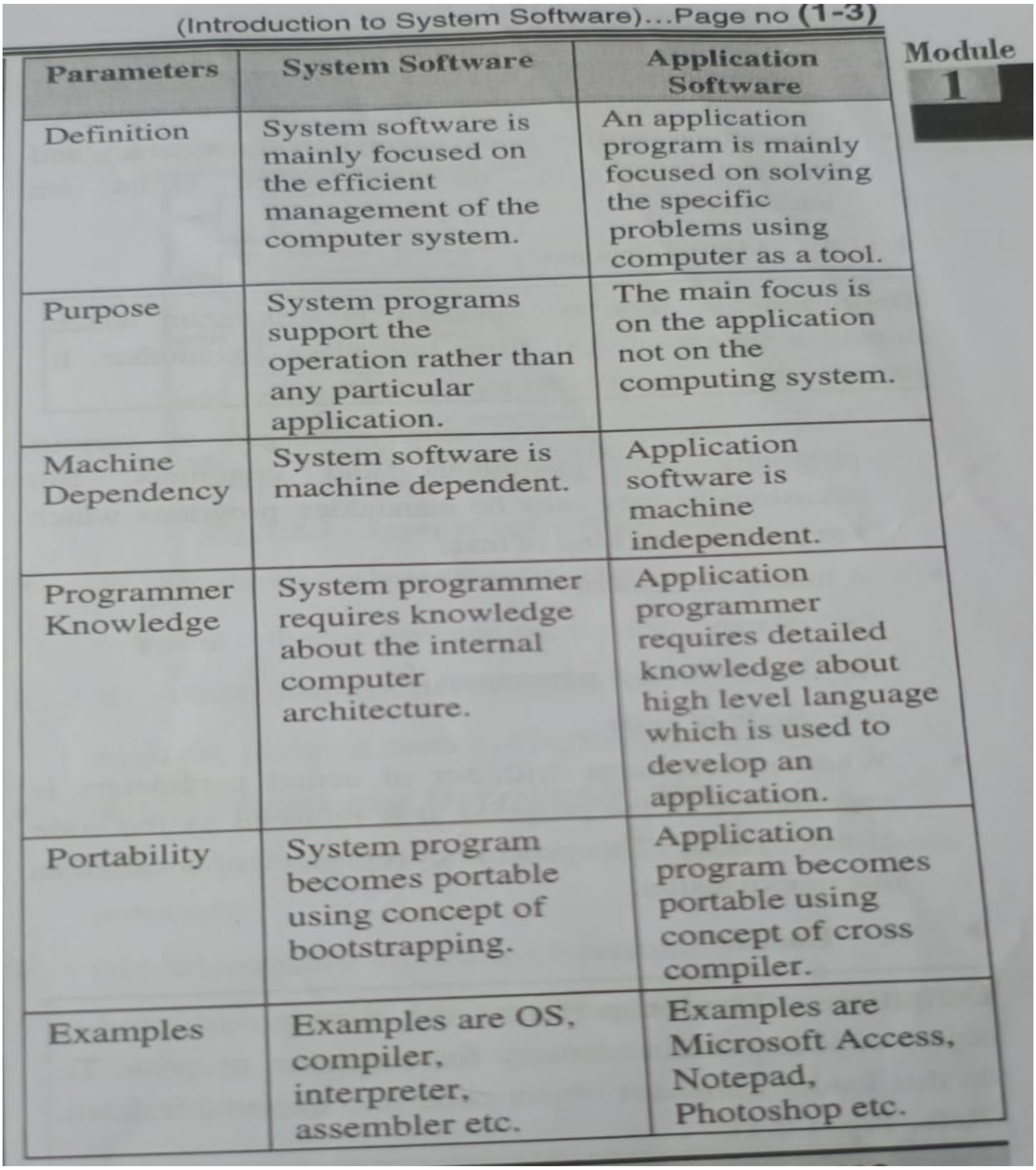
Assignment – I

Subject: SPCC (CSC601) **Sem: VI**

Class: TE. A/B/C **Year: FH2025**

Max. Marks: 10

Sr. No.	Question
Q. 1	Differentiate between application program and system program.

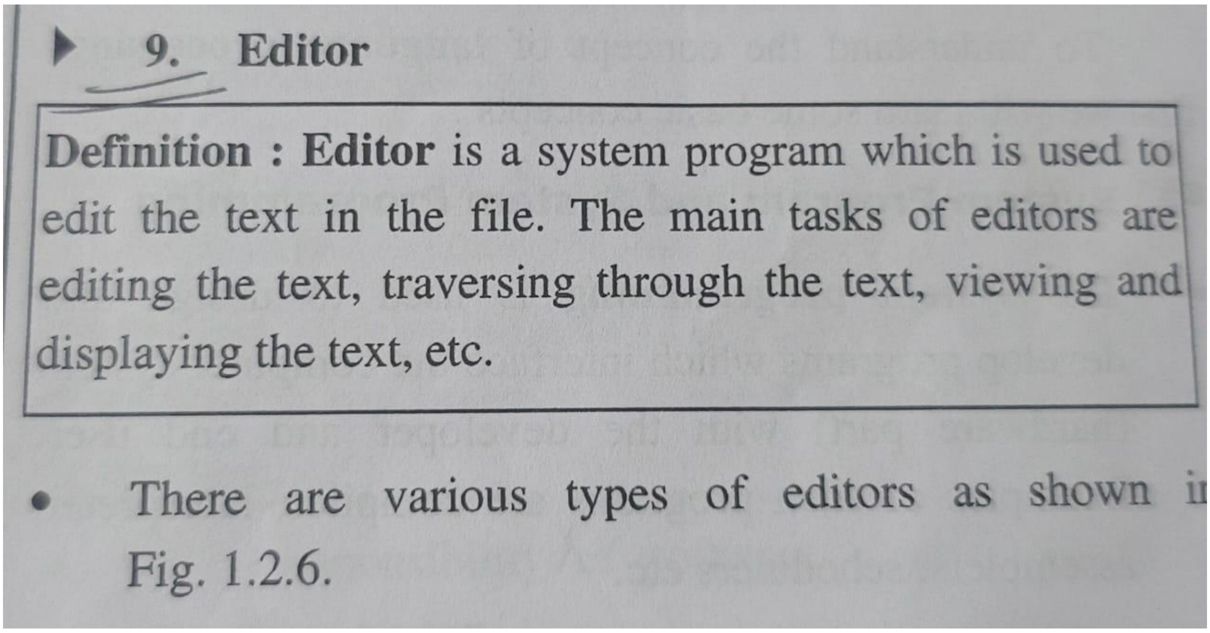


(Introduction to System Software)...Page no (1-3)

Module 1

Parameters	System Software	Application Software
Definition	System software is mainly focused on the efficient management of the computer system.	An application program is mainly focused on solving the specific problems using computer as a tool.
Purpose	System programs support the operation rather than any particular application.	The main focus is on the application not on the computing system.
Machine Dependency	System software is machine dependent.	Application software is machine independent.
Programmer Knowledge	System programmer requires knowledge about the internal computer architecture.	Application programmer requires detailed knowledge about high level language which is used to develop an application.
Portability	System program becomes portable using concept of bootstrapping.	Application program becomes portable using concept of cross compiler.
Examples	Examples are OS, compiler, interpreter, assembler etc.	Examples are Microsoft Access, Notepad, Photoshop etc.

Q.2 Write a note on Editor and its type or on text editor



9. Editor

Definition : Editor is a system program which is used to edit the text in the file. The main tasks of editors are editing the text, traversing through the text, viewing and displaying the text, etc.

- There are various types of editors as shown in Fig. 1.2.6.

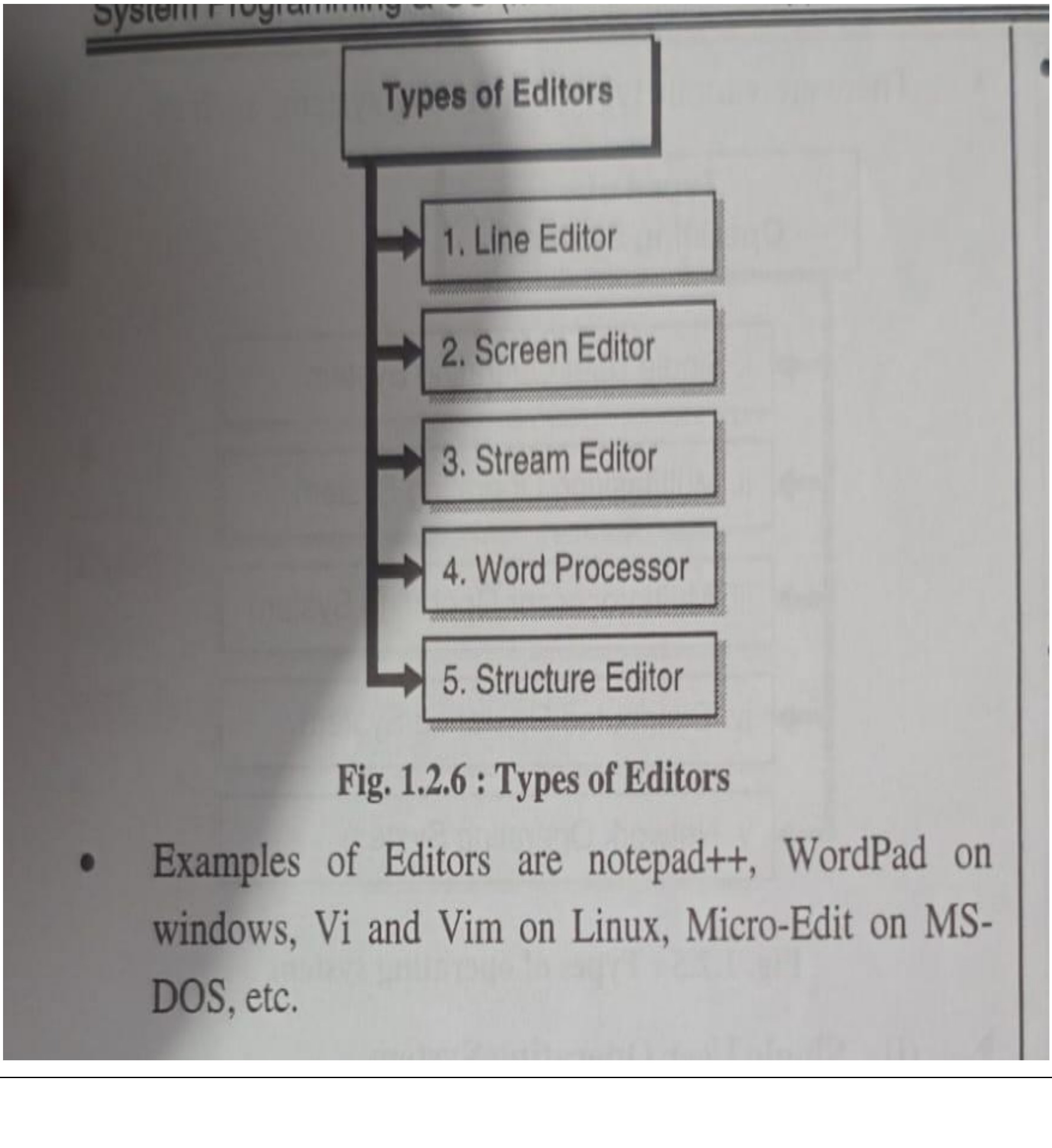
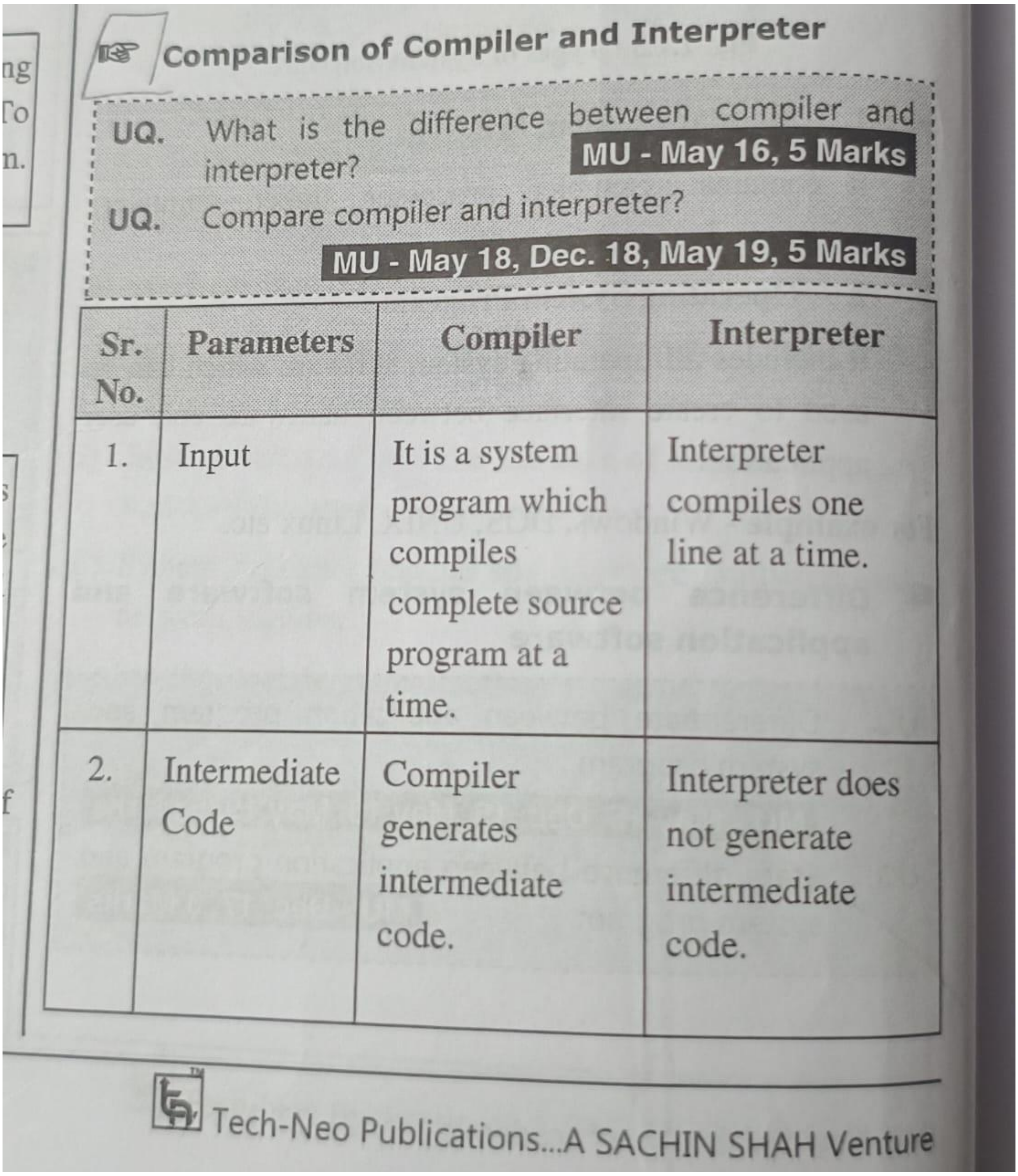


Fig. 1.2.6 : Types of Editors

- Examples of Editors are notepad++, WordPad on windows, Vi and Vim on Linux, Micro-Edit on MS-DOS, etc.

Q.3 Compare Compiler and Interpreter.

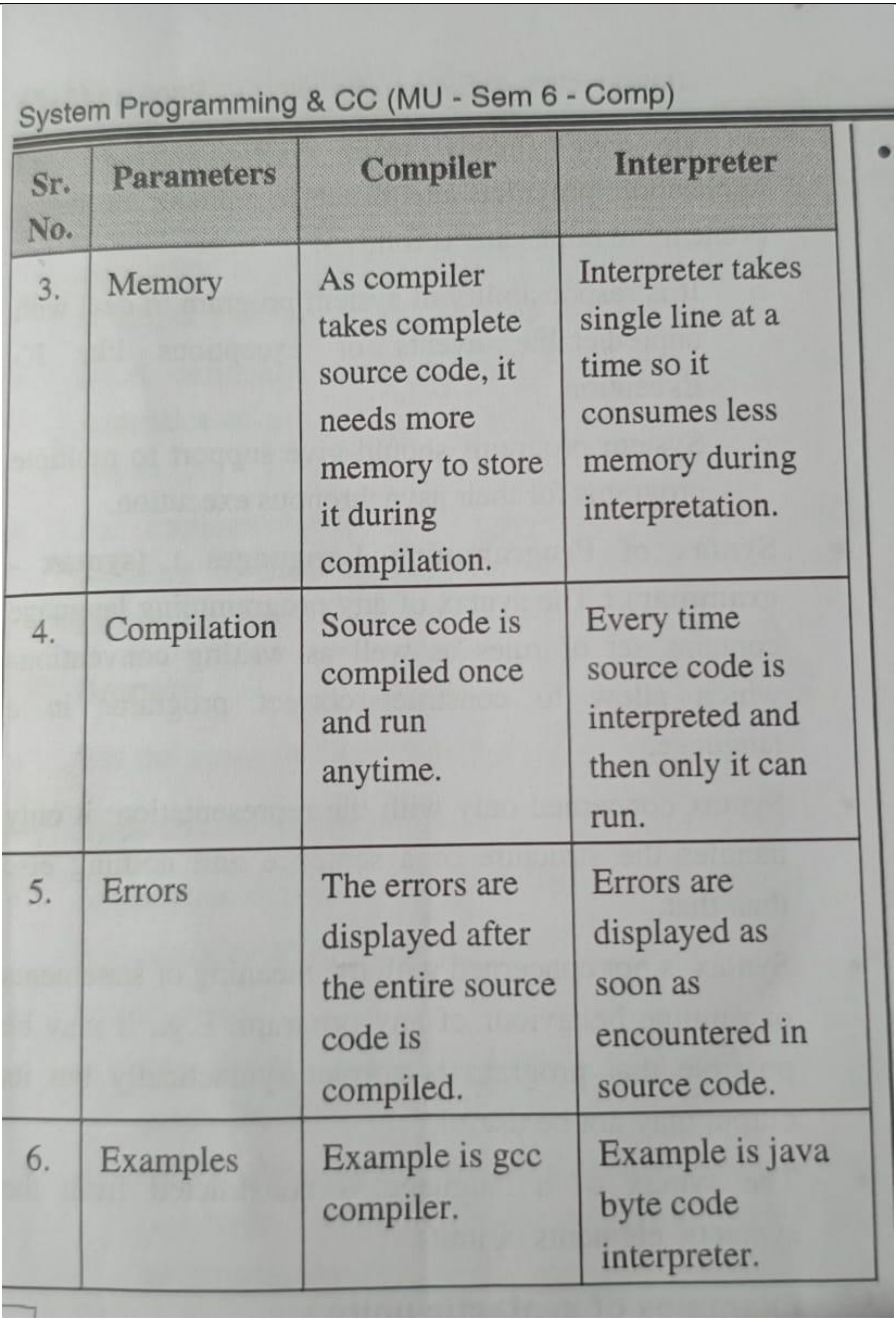


Comparison of Compiler and Interpreter

UQ. What is the difference between compiler and interpreter? **MU - May 16, 5 Marks**

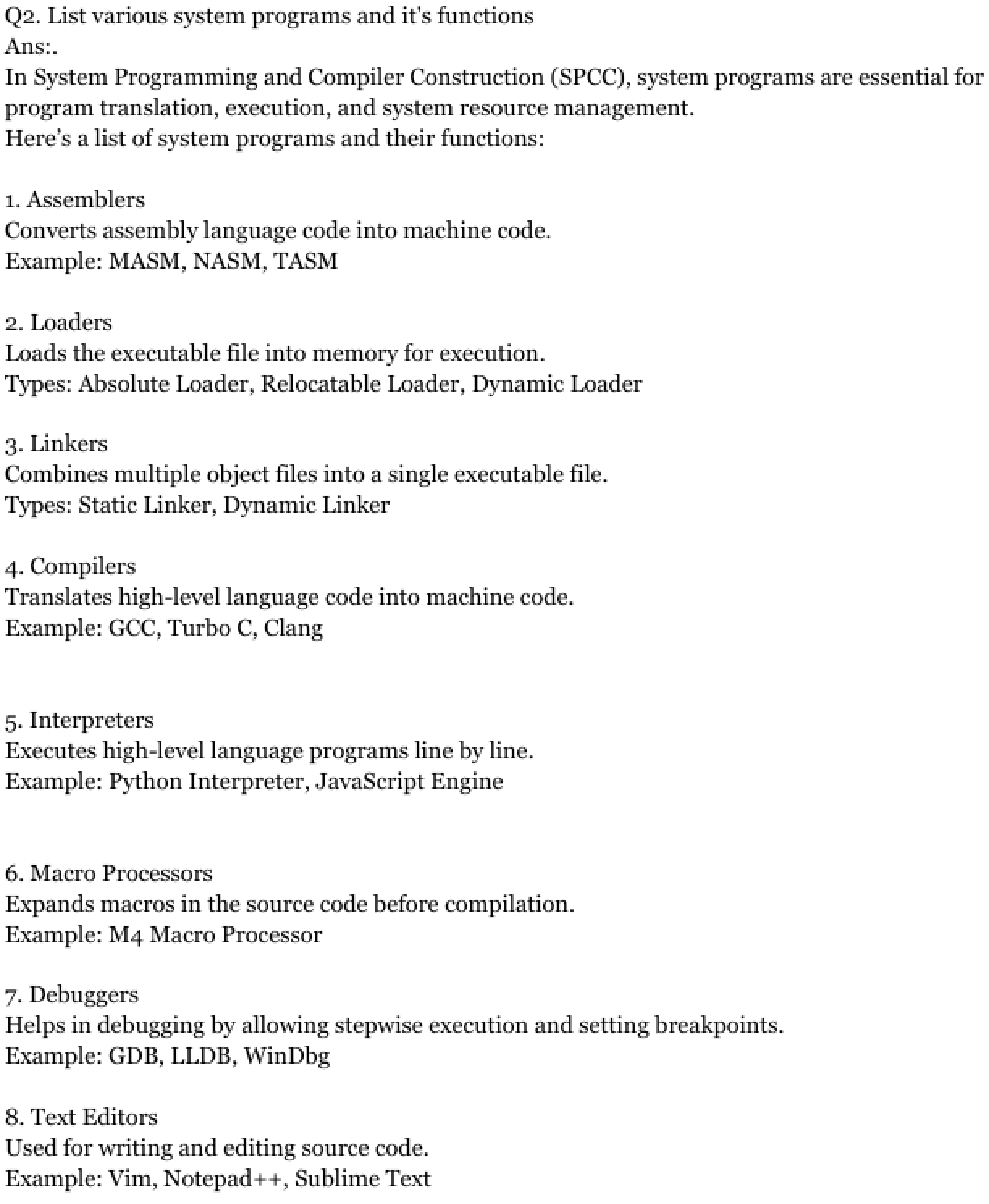
UQ. Compare compiler and interpreter? **MU - May 18, Dec. 18, May 19, 5 Marks**

Sr. No.	Parameters	Compiler	Interpreter
1.	Input	It is a system program which compiles complete source program at a time.	Interpreter compiles one line at a time.
2.	Intermediate Code	Compiler generates intermediate code.	Interpreter does not generate intermediate code.



Sr. No.	Parameters	Compiler	Interpreter
3.	Memory	As compiler takes complete source code, it needs more memory to store it during compilation.	Interpreter takes single line at a time so it consumes less memory during interpretation.
4.	Compilation	Source code is compiled once and run anytime.	Every time source code is interpreted and then only it can run.
5.	Errors	The errors are displayed after the entire source code is compiled.	Errors are displayed as soon as encountered in source code.
6.	Examples	Example is gcc compiler.	Example is java byte code interpreter.

Q.4 Write note on Software Tools.



Q2. List various system programs and it's functions
Ans:.
In System Programming and Compiler Construction (SPCC), system programs are essential for program translation, execution, and system resource management.
Here’s a list of system programs and their functions:

1. Assemblers
Converts assembly language code into machine code.
Example: MASM, NASM, TASM

2. Loaders
Loads the executable file into memory for execution.
Types: Absolute Loader, Relocatable Loader, Dynamic Loader

3. Linkers
Combines multiple object files into a single executable file.
Types: Static Linker, Dynamic Linker

4. Compilers
Translates high-level language code into machine code.
Example: GCC, Turbo C, Clang

5. Interpreters
Executes high-level language programs line by line.
Example: Python Interpreter, JavaScript Engine

6. Macro Processors
Expands macros in the source code before compilation.
Example: M4 Macro Processor

7. Debuggers
Helps in debugging by allowing stepwise execution and setting breakpoints.
Example: GDB, LLDB, WinDbg

8. Text Editors
Used for writing and editing source code.
Example: Vim, Notepad++, Sublime Text

<table>
<tr><td>Q.5</td><td>Discuss with example forward Reference. & how it is handled in assembler design.</td></tr>
<tr><td>Q.6</td><td>Explain design of 2-pass assembler with flowcharts and databases.</td></tr>
<tr><td>Q.7</td><td>Generate Pass1 & Pass2 assembler and show the content of databases involved in it.
<table>
<tr><td></td><td>START</td><td>0</td></tr>
<tr><td>BEGIN</td><td>BALR</td><td>15,0</td></tr>
<tr><td></td><td>USING</td><td>*,15</td></tr>
<tr><td></td><td>L</td><td>3,=F'34'</td></tr>
<tr><td></td><td>A</td><td>3,OLDOH</td></tr>
<tr><td></td><td>S</td><td>3,RECPT</td></tr>
<tr><td></td><td>ST</td><td>3,ISSUE</td></tr>
<tr><td>OLDOH</td><td>DC</td><td>F'9'</td></tr>
<tr><td>RECPT</td><td>DC</td><td>F'4'</td></tr>
<tr><td>ISSUE</td><td>DS</td><td>1F</td></tr>
<tr><td></td><td>END</td><td></td></tr>
</table></td></tr>
<tr><td>Q.8</td><td>Explain design of single pass assembler with flowcharts and databases.</td></tr>
<tr><td>Q.9</td><td>Explain Macro & macro Expansion with example.</td></tr>
<tr><td>Q.10</td><td>Explain different features of macro with suitable example.</td></tr>
<tr><td>Q.11</td><td>Draw flowchart and explain the two pass macro processor with its databases.</td></tr>
</table>

Q.12

Construct the necessary data structures after compiling the above code by pass 1 of two pass macro processor.

	MACRO	
	ADD1	&arg1,&arg2
	LOAD	&arg1
	ADD	&arg2
	STORE	&arg1
	MEND	
	MACRO	
	MUL1	&arg3,&arg4
	MOV	A,00
	MOV	C,&arg4
Repeat	ADD	&arg3
	DEC	C
	JNC	Repeat
	MEND	
	START	0
	ADD1	N1,N2
	MUL1	N3,N4
N1	DB	1
N2	DB	2
N3	DB	3
N4	DB	4
	END	