

10 Programming Construction

10. Program construction	
Content	Amplification
	Candidates should be able to demonstrate and apply knowledge and understanding on the following:
Translators	<ul style="list-style-type: none">• the purpose of the three common types of program translator:<ul style="list-style-type: none">• compilers• interpreters• assemblers• the appropriate use of the three common types of program translator• the principal stages involved in the compilation process:<ul style="list-style-type: none">• lexical analysis• syntax analysis• semantic analysis• code generation• code optimisation• examples of programming errors:<ul style="list-style-type: none">• logical• syntactical• run-time/execution• linking• rounding• truncation

10. Computer programs can contain different types of error.

(a) Giving an example, state what is meant by a *syntax error*. [2]

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(b) Giving an example, state what is meant by a *run time error*. [2]

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(c) Giving an example, state what is meant by a *logical error*. [2]

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11. Computer programs sometimes contain errors.

Name three different types of error that could occur in a computer program. Give an example of each type of error. [6]

Error 1

Example

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Error 2

Example

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Error 3

Example

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(a) State the name of the **two** different types of programming error described below.

(i) Unexpectedly halts the program. [1]

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(ii) The program produces the wrong output. [1]

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(b) Another error can result from incorrectly using the rules or grammar of the programming language.

(i) Name this error. [1]

(ii) State when this error is detected. [1]

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6. (a) A software house encourages its programmers to use libraries when developing software.

Explain why it is good programming practice to use such libraries when developing computer programs. [4]

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(b) If a program calls a library routine that has not been loaded correctly an error occurs. Name this type of error. [1]

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Computer programs require *translation* to execute.

- (a) *Compilers* and *interpreters* translate high level programming languages into machine code. Describe the main differences between a compiler and an interpreter. [4]

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(b) State the main difference between an *assembler* and both a compiler and an interpreter. [1]

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Syntax errors are a type of programming error.

Giving specific examples, describe **two** other different types of programming errors.

[6]

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5. Describe and give examples of the following types of programming errors.

[6]

Error	Description	Example
Runtime/ execution		
Linking		
Rounding		

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The following code, which contains errors, is written in a certain high-level programming language:

```
1  Declare CountProc
2  Count is integer
3  set Count = 0
4
5  for i = 1 t 1000
6      Cout = Count + i
7      output Count
8  next i
9
10 End Subroutine
```

- (i) Describe the difference in the way in which this code would be interpreted and the way in which this code would be compiled. [2]
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(ii) Discuss the benefits and drawbacks of compilers and interpreters.

[4]