AP COMPUTER SCIENCE PRINCIPLES • EXERCISE SHEET

3.1 Variables and Assignments

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

KEY WORDS variable 变量 • assignment 赋值 • data types 数据类型 • string 字符串

Objective

Build the skills to answer exam questions on **variables and assignments**.

You must be able to:

- explain how a **variable** 变量 is a named reference that stores a value
- use an **assignment** 赋值 statement to store or update a value
- describe how a variable can hold different **data types** 数据类型
- trace how a variable's value changes as a program runs

1 Worked examples

Study these first. Each one shows the method for a question type used later.

> ■ **Variable and assignment**
>
> A **variable** is a named box that holds a value in memory. An **assignment** (setting `x` to `5`) stores or updates that value.
>
> ■ **Data types**
>
> A variable can hold a **number**, a **string** (text), or a **Boolean** (true/false).
>
> ■ **Tracing**
>
> Follow the value line by line: set `x` to `3`, then set `x` to `x + 2`, and `x` is now `5`.

2 Practice

2.1 Define a variable. [1]

2.2 A program sets `x` to `4`, then sets `x` to `x × 3`. State the final value of `x`. [2]

2.3 State one benefit of using descriptive variable names. [1]

3 Exam-style questions

3.1 An assignment statement is used to [1]

- **A** print output
- **B** store a value in a variable
- **C** repeat code
- **D** define a function

3.2 Which of these values is a Boolean? [1]

- **A** `42`
- **B** `"hello"`
- **C** `true`
- **D** `3.14`

3.3 A program runs: set `a` to `10`; set `b` to `a + 5`; set `a` to `2`.

(a) State the final value of `a`. [1]

(b) State the final value of `b`. [1]

(c) State a good variable name for a value holding a student's age. [1]

Solutions

2.1 a named reference that stores a value in memory.

2.2 $4 \times 3 = 12$.

2.3 it makes the program easier to read and understand.

3.1 B.

3.2 C.

3.3 (a) `2`. (b) `15` (set before `a` changed). (c) any clear name such as `studentAge`.