AP COMPUTER SCIENCE A • EXERCISE SHEET

1.13 Object Creation and Storage (Instantiation)

Name: _____ Class: _____ Date: _____ **Total: 8 marks**

Objective

Build the skills to answer exam questions on **object creation and storage (instantiation)**.

You must be able to:

- create an object by calling a **constructor** 构造方法 with `new`
- understand that a **reference variable** 引用变量 stores the object's location
- describe what it means for a reference to hold `null`
- recognize that two references can form an **alias** 别名

1 Worked examples

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

■ Creating an object

`Dog d = new Dog();` —the `new` keyword allocates memory and calls the **constructor** (instantiation).

■ Reference variables and null

A **reference variable** stores the object's **location**, not the object itself. A reference of value `null` refers to **no object**.

■ Alias

`Dog e = d;` makes `e` and `d` refer to the **same** object —an alias.

2 Practice

2.1 State the keyword used to create an object. [1]

2.2 State what a reference variable stores. [1]

2.3 State what `null` means. [1]

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3 Exam-style questions

3.1 An object is created with the keyword [1]

- **A** `make`
- **B** `new`
- **C** `create`
- **D** `class`

3.2 A reference variable that refers to no object holds [1]

- **A** `0`
- **B** `null`
- **C** `""`
- **D** `false`

3.3 `Cat a = new Cat(); Cat b = a;`.

(a) State how many `Cat` objects exist. [1]

(b) State what `b` refers to. [1]

(c) Name the situation of two references to one object. [1]

4 Go further

- work through the **1.13 Object Creation and Storage** lesson on the **Learn** page;
- read the **Using Objects** section of the AP Computer Science A handout on the **Know** page.

Solutions

2.1 `new`.

2.2 the location (memory address) of the object.

2.3 it refers to no object.

3.1 B.

3.2 B.

3.3 (a) one. (b) the same object as `a`. (c) an alias.