

# 1.13 Object Creation and Storage (Instantiation)

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Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

Total: 8 marks

**KEY WORDS** reference variable 引用变量 • alias 别名 • constructor 构造方法 • instantiation 实例化  
• null 空值

## Objective

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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

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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

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

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**2.2** State what a reference variable stores. [1]

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**2.3** State what `null` means. [1]

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## 3 Exam-style questions

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**3.1** An object is created with the keyword [1]

- **A** `make`
  - **B** `new`
  - **C** `create`
  - **D** `class`
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**3.2** A reference variable that refers to no object holds [1]

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

## Solutions

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**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.