AP COMPUTER SCIENCE A • EXERCISE SHEET

3.4 Constructors

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

KEY WORDS constructor 构造方法

Objective

Build the skills to answer exam questions on **constructors**.

You must be able to:

- write a **constructor** 构造方法 that sets the initial state of a new object
- use **parameters** to give each object its starting values
- understand that a constructor runs when an object is created with `new`

1 Worked examples

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

■ Constructors

A **constructor** sets a new object's **initial state**. It has the class's name, takes parameters, and runs when you use `new`:

```
public Dog(String n) {
    name = n;   // set the starting value
}
```

`new Dog("Rex")` runs this constructor and stores `"Rex"` as the dog's name.

■ A no-argument constructor

A class may have more than one constructor. A **no-argument** constructor sets defaults:

```
public Dog() {
    name = "Unknown";
}
```

`new Dog()` uses this one; `new Dog("Rex")` uses the parameterised one. Java chooses by the arguments you pass.

2 Practice

2.1 State what a constructor does. [1]

2.2 State when a constructor runs. [1]

2.3 State how a constructor gives each object different starting values. [1]

3 Exam-style questions

3.1 A constructor runs when an object is [1]

- **A** printed
- **B** created with `new`
- **C** deleted
- **D** compared

3.2 A constructor sets an object's [1]

- **A** final value
- **B** initial state
- **C** return type
- **D** superclass

3.3 The statement `new Student("Ana", 16)` is run.

(a) State what runs as a result. [1]

(b) Name `"Ana"` and `16` in this call. [1]

(c) State what the constructor sets up. [1]

Solutions

2.1 it sets the initial state of a new object.

2.2 when an object is created with `new`.

2.3 through its parameters, which supply each object's starting values.

3.1 B.

3.2 B.

3.3 (a) the constructor. (b) arguments. (c) the object's initial state.