

EXAMINATION INSTRUCTIONS

NAME: _____

PERSON NUMBER: _____

SIGNATURE: _____

This examination has 6 pages. Check that you have a complete paper.
Each candidate should be prepared to produce, upon request, his or her SUNY/UB card.

This examination has 5 questions. Answer all questions.

You have 60 minutes to complete this examination. Use your time accordingly.

READ AND OBSERVE THE FOLLOWING RULES:

- ▶ Names are pre-printed on the exam booklets. Ensure that you have YOUR exam.
- ▶ Sign, using your usual signature, in the space provided on the back cover.
- ▶ All of your writing must be handed in. This booklet must not be torn or mutilated in any way, and must not be taken from the examination room.
- ▶ Show all of your work in arriving at an answer, unless instructed otherwise. Partial credit will be awarded as appropriate.
- ▶ Candidates are not permitted to ask questions of the invigilators, except in cases of supposed errors or ambiguities in examination questions.
- ▶ CAUTION – Candidates guilty of any of the following, or similar, dishonest practices shall be immediately dismissed from the examination and shall be liable to disciplinary action.
 - ◆ Making use of any books, papers or memoranda, calculators or computers, audio or visual cassette players, or other memory aid devices, other than those explicitly authorised by the examiners.
 - ◆ Speaking or communicating with other candidates.
 - ◆ Purposely exposing written papers to the view of other candidates. The plea of accident or forgetfulness shall not be received.

----- DO NOT WRITE BELOW THIS LINE! -----

Q1	Q2	Q3	Q4	Q5	TOTAL	%
/10	/10	/10	/10	/10	/50	/100

Question 1 [10 points, 2 points each]

The code given below is correct: it compiles without errors.

Circle, and identify by number, one **and only one** example of each of the following items in the code below. If you believe no example exists, write “no example” next to that item in the list. To show you how I want the question answered, *the first one is done for you*.

1. access control modifier
2. expression
3. class body
4. fully qualified name
5. argument
6. assignment statement

```
1 package part1;p
   public class Farm {
       private example1.BarnYard _yard;

       public Farm() {
           _yard = new example1.BarnYard();
       }

       public void addOneMovingChicken() {
           example1.Chicken c = new example1.Chicken();
           _yard.addChicken(c);
           c.start();
       }

       public void addOneMovingPig() {
           example1.Pig p = new example1.Pig();
           _yard.addPig(p);
           p.start();
       }

       public void addOneMovingButterfly() {
           example1.Butterfly b = new example1.Butterfly();
           _yard.addButterfly(b);
           b.start();
       }
   }
```

Question 2 [10 points, 2 points each]

For each of the following questions, select the **BEST** answer from the available choices.

[2 POINTS] Where in memory are method invocation records stored?

- a) secondary storage
- b) heap
- c) static region
- d) runtime stack

[2 POINTS] Where in memory are static variables stored?

- a) secondary storage
- b) heap
- c) static region
- d) runtime stack

[2 POINTS] From which area of memory does 'new' allocate space?

- a) secondary storage
- b) heap
- c) static region
- d) runtime stack

[2 POINTS] Which of the following has the same value as 1110_2 ?

- a) 7_{10}
- b) 14_{10}
- c) 28_{10}
- d) 56_{10}

[2 POINTS] What is the value of a 'new' expression, like `new part2.Farm()` ?

- a) a reference
- b) an instance
- c) a variable
- d) an object

Question 3 [10 points, 2 points each]

The code sample given below is correct: it compiles without errors.

```
package exam1;
public class FamilyFarm {
    public FamilyFarm() {
        example1.BarnYard enclosure;
        enclosure = new example1.BarnYard();
        example1.Chicken daisy;
        daisy = new example1.Chicken();
        example1.Pig wilbur;
        wilbur = new example1.Pig();
        enclosure.addChicken(new example1.Chicken());
        enclosure.addPig(wilbur);
    }
}
```

ANSWER THE QUESTIONS BELOW:

- a) How many variables are declared in the code shown above? [2 points]

For questions **(b) through (e)** assume that the class exam1.FamilyFarm is instantiated once.

- b) How many example1.BarnYard objects are created? [2 points]
- c) How many example1.Chicken objects are created? [2 points]
- d) How many exam1.FamilyFarm objects are created? [2 points]
- e) How many objects are added to BarnYard enclosure? [2 points]

Question 4 [10 points – 10 points perfect, 7 points essentially correct but with small mistakes, 3 points clearly wrong but with some correct elements, 0 points for anything else]

Study the following partial class definition (the omitted parts are not relevant to the question). Complete the definition of a parameterless void method named `swap` so that it interchanges the values of the the two instance variables `_a` and `_b`.

```
package exam;
```

```
public class Question4 {
```

```
    private String _a;  
    private String _b;
```

```
    public Question4() {  
        // body of constructor not relevant to question  
    }  
  
    // define your swap method below:
```

```
}
```

Question 5 [10 points]

Complete each of the following sentences. Choose **the best answer** for each sentence from the phrases given below. You may use each phrase at most once; not all phrases will be used.

- A variable declaration determines a/the _____ and a name for a variable.
- When carrying out an assignment statement a/the _____ on the right of the a/the _____ operator is evaluated first, and the resulting value is stored in a/the _____ on the left.
- When performing a method call, the _____ are evaluated and the resulting values are assigned to the corresponding _____.
- The 'new' operator allocates memory on the _____ to hold the representation of an object.
- _____ variables are stored on the runtime stack.
- An _____ is an instance of a _____.

PHRASES:

- | | |
|---------------|------------------|
| a) arguments | j) local |
| b) assignment | k) variable |
| c) object | l) heap |
| d) parameters | m) private |
| e) class | n) type |
| f) method | o) name |
| g) instance | p) value |
| h) stack | q) reserved word |
| i) expression | r) package |