# Programming Theory Questions

These questions refer to the Preliminary Material and require you to load the Skeleton Program,   
but do not require any additional programming.

## Write-on format

1. Give an example of instantiation from the skeleton program. [1 mark]

2. State the name of an identifier(s) for the following:

a. A list variable [1 mark]

b. A subclass [1 mark]

c. A parent class [1 mark]

d. A constant that stores a float [1 mark]

e. A class variable [1 mark]

f. An accessor method [1 mark]

g. A mutator method [1 mark]

h. A variable that is used to store a whole number. [1 mark]

3 a. Two classes that have a composition association. [2 marks]

b. Why is Warren to Rabbit not an example of aggregation association? [1 mark]

4. Are there any examples of polymorphism in the skeleton code? [1 mark]

5. State the name of an identifier for a procedure or function that is overridden in a subclass. [1 mark]

6. Look at the EatRabbits subroutine in the Warren class in the skeleton program.

Why does the generation of a random rabbit need to be inside a repetition structure? [1 mark]

7. Look at the Warren class. Why has a named constant been used instead of a numeric value? [2 marks]

8. State the name of an identifier for an enumerated data type. [1 mark]

9. How could the Fox class be changed to make the foxes live longer? [1 mark]

10. What is the purpose of the variable AlreadySpread in the Warren class and how is it used? [4 marks]

11. What is the purpose of the method CompressRabbitList? [2 marks]

12. Why is it necessary to store the gender of the rabbits? [2 marks]

13. Identify six errors in the section of UML diagram below. [6 marks]

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| --- |
| **Warren** |
| MAX\_RABBITS\_IN\_WARREN  RabbitCount  PeriodsRun = 0  AlreadySpread = True  Variability |
| CalculateRandomValue(BaseValue, Variability)  GetRabbitCount()  NeedToCreateNewWarren()  WarrenHasDiedOut()  AdvanceGeneration(ShowDetail)  EatRabbits(RabbitsToEat)  KillByOtherFactors(ShowDetail)  AgeRabbits(ShowDetail)  MateRabbits(ShowDetail)  CompressRabbitList(DeathCount)  ContainsMales()  ContainsFemales()  ListRabbits() |

|  |
| --- |
| **Location** |
| Warren  Rabbit |

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14. Create a UML diagram to show the relationship between rabbits, foxes and animals.

All variables and methods must be shown. [11 marks]

15. What conditions are needed for a new warren to be created? [2 marks]

16. State the name of an identifier for a variable that holds:

a. An integer value [1]

b. A string value [1]

c. A real value [1]

d. A Boolean value [1]

TOTAL MARKS

/50