

BCS THE CHARTERED INSTITUTE FOR IT
BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 5 Diploma in IT

OBJECT ORIENTED PROGRAMMING

Tuesday 25th September 2018 - Afternoon

Answer **any** FOUR questions out of SIX. All questions carry equal marks
Time: TWO hours

Answer any Section A questions you attempt in Answer Book A
Answer any Section B questions you attempt in Answer Book B

The marks given in brackets are **indicative** of the weight given to each part of the question.

Calculators are NOT allowed in this examination.

Section A

Answer Section A questions in Answer Book A

A1

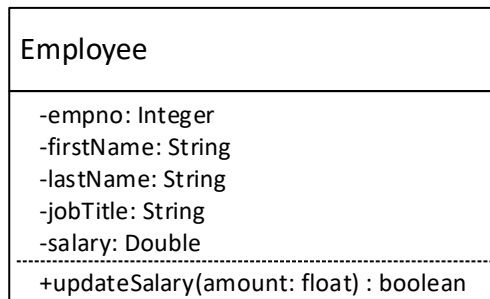
- a) Explain what is meant by:
- i) iterative software development;
 - ii) incremental software development.

(9 marks)

- b) Using examples from an object oriented programming language you are familiar with, discuss the suitability of object technology for iterative development.

(10 marks)

- c) Using the following UML class diagram:



explain what the following OCL statement means:

context: Employee::updateSalary(amount: float): boolean

pre: amount > 0

post: if amount > (salary@pre * 1.1) then

 result = false

else

 self.salary = amount

 result = true

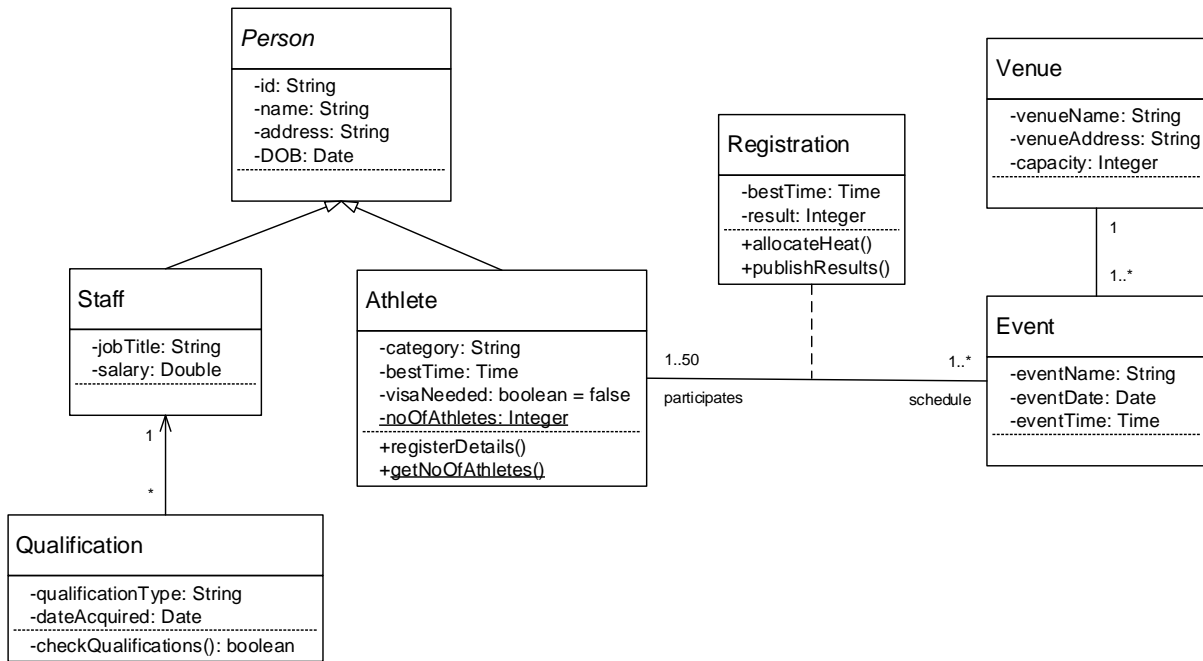
endif

(6 marks)

- A2** Choose FIVE features of the object oriented paradigm that you consider to be important for good software engineering practice. Describe what they are, explain why you think they are important and give examples of them; providing either code or a diagram.

(25 marks)

A3 The following class diagram represents a major sporting event, such as the Olympic Games:



Describe what the diagram represents. The description should include a section for each class shown in the diagram - the section can be referred to by the name of the class. Each section should consist of a full description of the variables and methods of the class. For each class, describe the relationships in which it takes part.

(25 marks)

Section B

Answer Section B questions in Answer Book B

B4

- a) Describe how is-a and has-a inter-class relationships may be implemented in object oriented programming, giving code examples to support your answer.
(10 marks)
- b) Explain the difference between the object oriented design concepts of generalisation and specialisation, and describe how these relate to the inheritance feature in object oriented programming languages.
(15 marks)

B5

- a) Describe TWO features of object oriented programming languages that promote code reuse.
(10 marks)
- b) Name THREE different types of polymorphism commonly available in object oriented programming languages, giving code examples to support your answer.
(15 marks)

B6

- a) Define the terms encapsulation and data hiding and describe the relationship between them.
(10 marks)
- b) Briefly explain the purpose of default, copy and conversion constructors and give a code example of each.
(15 marks)