VICTORIA
UNIVERSITY OF WELLINGTON

2013

MID-TRIMESTER TEST

SWEN 102
Introduction to Software
Modelling

Time Allowed: 50 Minutes

Instructions: There are 50 possible marks on the test.
Answer all questions in the boxes provided.
Every box requires an answer.
Non-electronic foreign language dictionaries are allowed.
Calculators ARE NOT ALLOWED.
No other reference material is allowed.

Question	Topic	Marks
1.	Use Cases	25
2.	Object and Class Diagrams	25
	Total	50

Question 1. Use Cases [25 marks]

(a) [3 marks] Perform a *textual analysis* on the following description, to find candidate use cases.

You should carefully and neatly underline key verb phrases in the text in the box.

SourceForge is a website used for software development. Software developers <u>develop programs</u> and <u>upload new versions</u>. Users <u>search the website</u> looking for programs to <u>download and use</u>.

To <u>upload a new version</u> of a program, the developer <u>provides a log message, and version number</u>. The log message details what changes were made. Version numbers must always increase when new versions are uploaded.

The creator of a project can <u>edit the information</u> shown about their projects. This includes the title, a short description and which programming languages are used. They can also <u>set permissions</u> allowing other users to upload new versions to the project.

Users <u>search the website</u> for software based on keywords they supply. Users can search the website without needing to <u>create an account</u> on SourceForge. Developers must <u>create an account</u> before they can <u>create or work on a project</u>. They must <u>log in</u> whenever they want to work on a project.

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(Question 1 continued)

(b) [9 marks] Draw **use case descriptions** for the following **three** use cases in this system.

Find project by searching

Find Project (User)	
1. Enter Keywords	
	2. Search Projects for Matches
	3. Display Results

Upload new version of program

Upload New Version (Developer)	
Requires: Logged On	
1. Choose Project	2. Verify Permission to Upload
3. Choose Files	
4. Provide Log Message	
5. Provide Version Number	6. Verify Version Number Increased
	7. Upload Project Files

Change project information

Change Project Information (Creator)	
Requires: Logged On	
1. Choose Project	2. Verify Project Creator
3. Provide Updated Information	4. Update Project

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(Question 1 continued)

(c) [9 marks] Draw a **use case diagram** showing at least 3 actors and at least 6 use cases that you would produce in a model of this system.
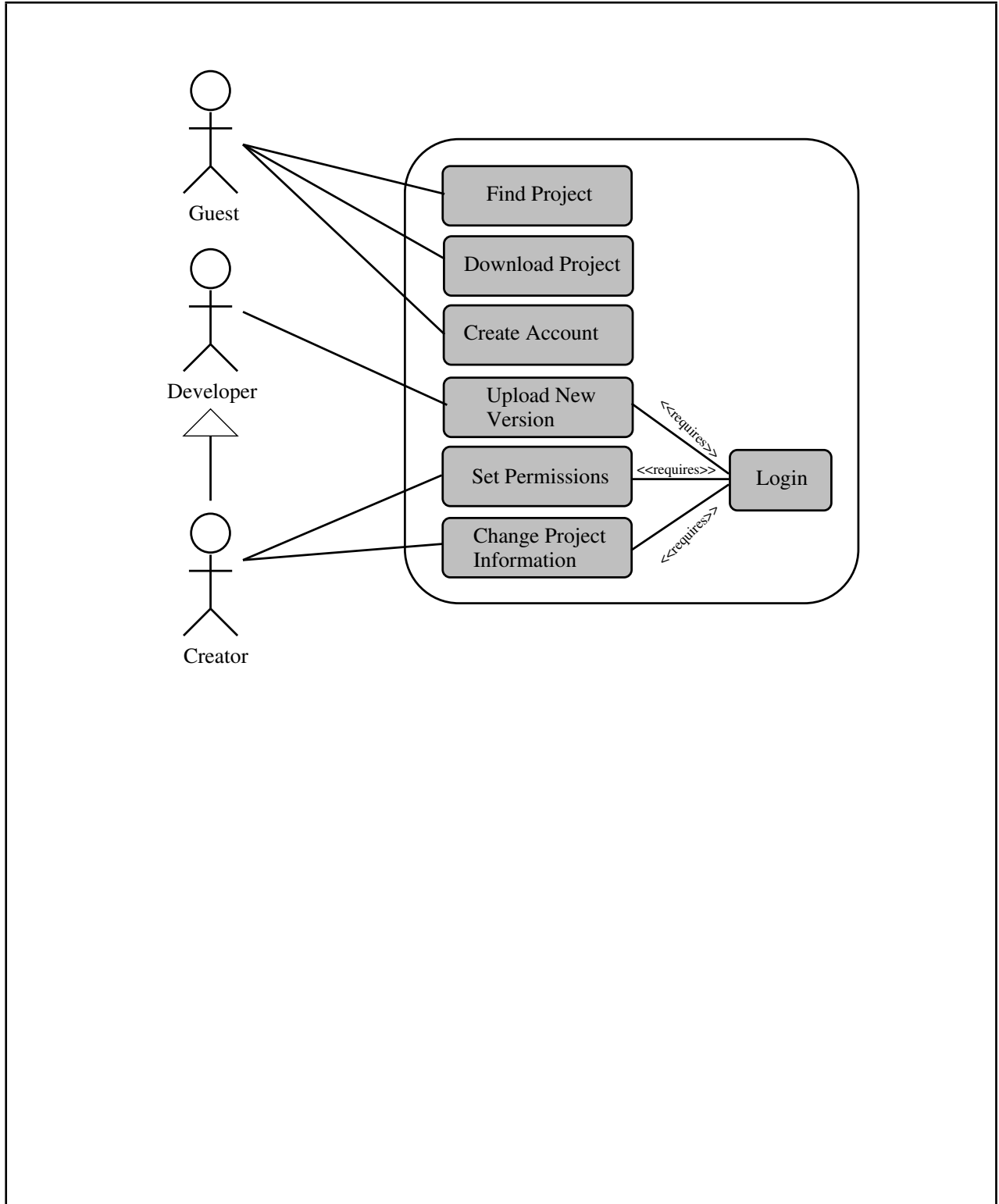
(Question 1 continued)

**(d)** [4 marks] Give characteristics for one actors in the system.

1. **Actor Name**

   Developer

2. Domain Knowledge

   Software Developers will have a very good knowledge of the software engineering domain.

3. System Knowledge

   Software Developers are likely to have a good knowledge of the sourceforge website, since they will interact with it frequently. However, they may not have used all its features (e.g. if they are not a project creator).

4. Frequency of Interaction

   The sourceforge website is specifically focused on developing software. Therefore, it is targeted at software developers and they are likely to be the most frequent users of the website.

Question 2. Object and Class Diagrams [25 marks]

Consider the following (incomplete) class diagram which models the game of chess, and answer the following questions.
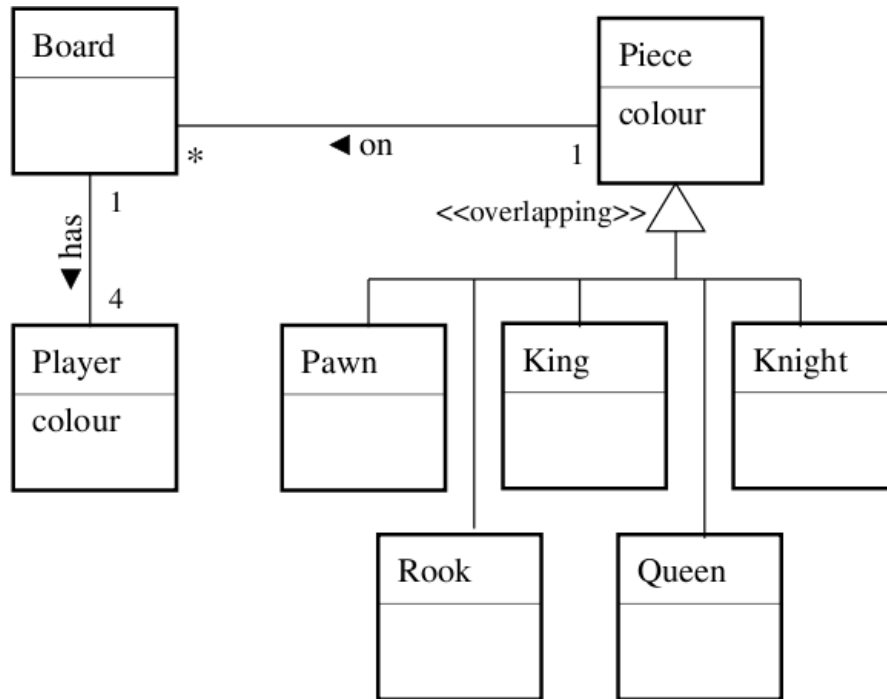
(a) [12 marks] For each question, state whether or not it is correct with respect to the above diagram. If it is not correct, briefly state why.

1. Each board may have one or more pieces on it

   Incorrect. Each board must have exactly one piece on it.

2. Every board has two players

   Incorrect. Every board has four players.

(Question 2 continued)

3 | Pawns and Kings are pieces

Correct.

4 | A piece cannot be both a Pawn and a King

Incorrect. Subclasses of piece are listed as *overlapping* and, hence, a piece can be both a Pawn and a King.

5 | Every piece is on a board
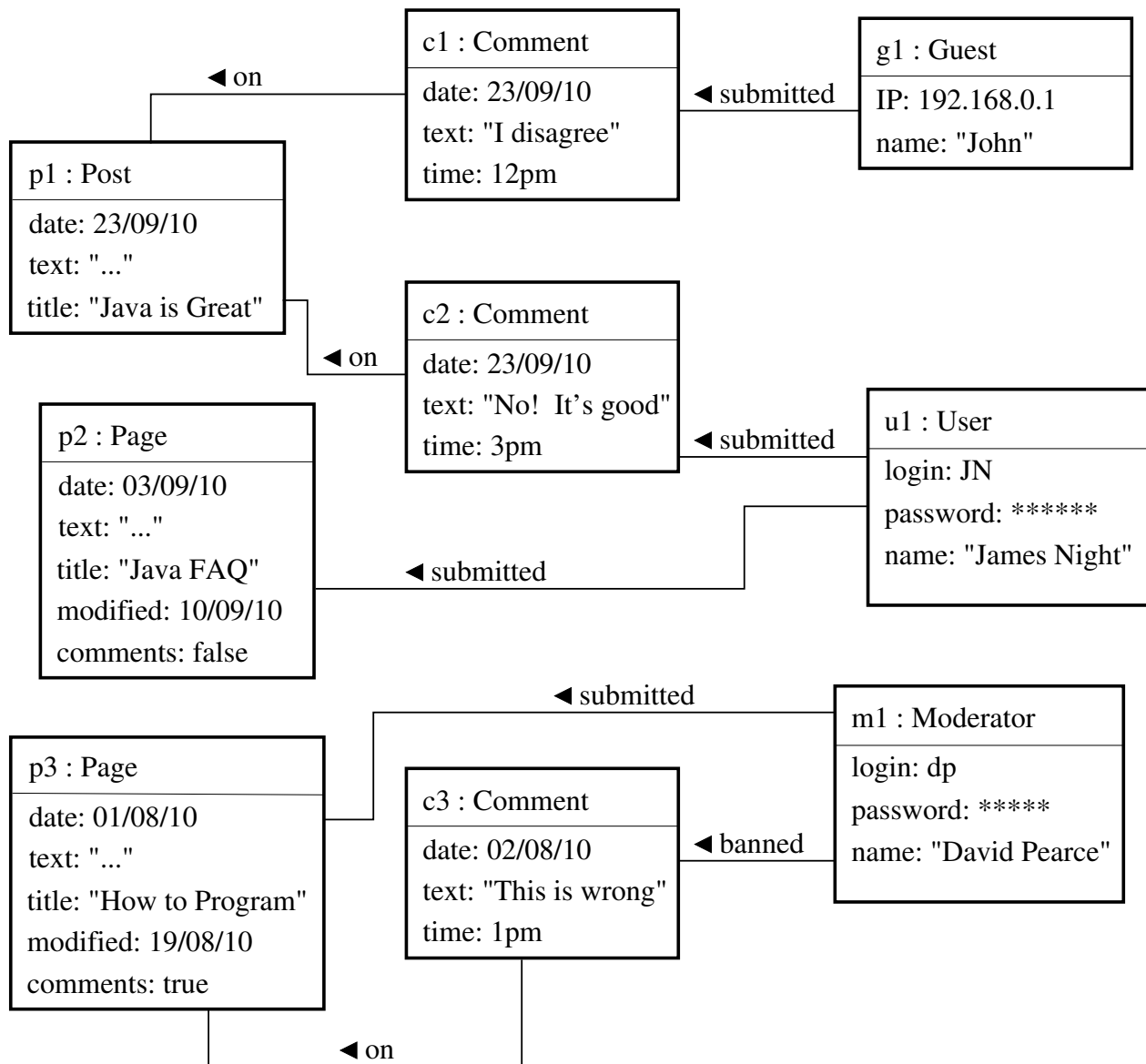
Incorrect. A piece is on zero or more boards.

6 | Every piece is either a Pawn, King, Knight, Rook or Queen (or a combination of them)
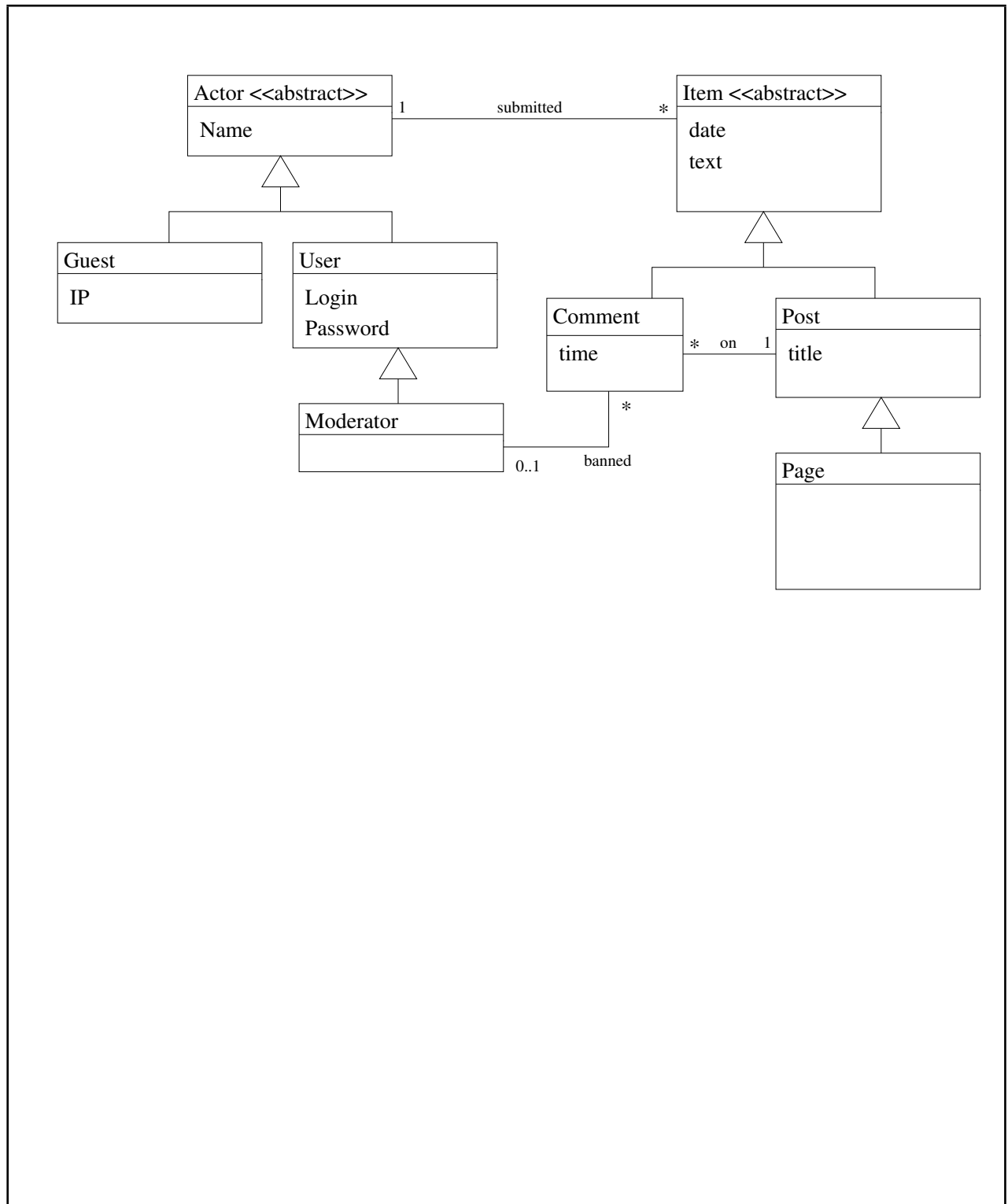
Incorrect — piece is not abstract!

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(Question 2 continued)

(b) [13 marks] Consider the object diagram below and draw a corresponding class diagram on the facing page.

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(Question 2 continued)

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SPARE PAGE FOR EXTRA ANSWERS

Cross out rough working that you do not want marked.
Specify the question number for work that you do want marked.

Student ID: . . . .

SPARE PAGE FOR EXTRA ANSWERS

Cross out rough working that you do not want marked.
Specify the question number for work that you do want marked.

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