The University Of New South Wales

None

COMP9321

Web Applications Engineering – Sample Exam Paper

(1)   Time allowed: **2 hours**

(2)   Total marks: **50**

(3)   Total number of questions: **5**

(4)   Answer any **5** out of **5** questions

(5)   Questions are of equal value

(6)   This paper may **not** be retained by the candidate

Print your student number and name in the top right hand corner of this page.

All answers must be written in ink. Except where they are expressly required, pencils may be used only for drawing, sketching or graphical work.

Note: THIS IS A SAMPLE QUESTION PAPER. There are 5 questions in this paper. Marks are awarded for quality and clarity, not quantity.

Question 1

(**10 Marks Total**) Consider the following block of HTML code:

```
<P align="justify">
You are a first time user. Please register with our site.
Type in your contact email and password (4 characters long).</P>
<FORM action="registerServlet" method="POST">
    <INPUT TYPE="text" NAME="email">
    <INPUT TYPE="password" NAME="password">
    <INPUT TYPE="hidden" NAME="isNew" VALUE="true">
    <INPUT TYPE="submit" VALUE="Register">
</FORM>
```

a) *(5 marks)* Assuming that the user filled in the form and pressed the `Register` button, explain how the input from the user is passed to the server-side using the `POST` request method. Discuss its implementation in the registerServlet.

b) *(3 marks)* An alternative request method is `GET`. Explain how `GET` passes the input from the user to the server-side.

c) *(2 marks)* Given the HTML code above, which request method would be better? Explain why.

Question 2

(**10 Marks Total**)

a) *(4 marks)* Explain what the term "session" means in Web applications and how it is implemented

b) *(3 marks)* Discuss support for caching in HTTP version 1.1

c) *(3 marks)* Explain with examples the methods by which multiple inheritance in classes can be mapped to tables within databases.

EXAM PAPER CONTINUES ....

Question 3

(10 Marks Total)

- *(2 marks)* Explain the difference between the include directive (ie., `<\%@ include file="filename" \%>`) and the include action (ie., `<jsp:include page="filename" />`) in JSP.

- *(3 marks)* Discuss, in detail, the role of the Controller in a web application based on the Model-View-Controller pattern. (Note: this explains the Front Controller (Command) Design pattern).

- *(5 marks)* Discuss the scaling of databases by replication.

Question 4

(10 Marks Total)

- *(2 marks)* Explain the concept of "third-party cookies".

- *(3 marks)* Discuss a method to incorporate user interaction time in performance analysis of web applications.

- *(5 marks)* Consider a web-based book store wherein the users search for books, add selected books to a shopping cart, pay for the selected books using their credit card, and get a confirmation from the store. Using pseudo-code, discuss how you would guide the user through this ordered sequence of requests. How would you prevent the user from accessing the payment page before adding any books to their cart ?

Question 5

(10 Marks Total)

a) *(4 marks)* Explain SQL injection attacks with an example. How can they be prevented ?

b) *(3 marks)* Discuss how caching can be controlled using HTTP headers.

c) *(3 marks)* What are the advantages and disadvantages of using `PreparedStatement` in place of regular JDBC `Statement` ?

END OF EXAM PAPER