CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ

Semester 2 Examinations 2013/14

Module Title: : Cloud Application Development

Module Code: **SOFT 8022**

School: Science and Informatics

Programme Title(s): BSc. Cloud Computing

Programmes Code(s): **KCLDC _8_Y4**

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Internal Examiner(s): **Dr. Donna O'Shea**

Instructions: **Answer 3 questions. Within each question answer all parts. All questions carry equal marks.**
For multiple choice questions identify the correct answer by stating it in the answer book.

Duration: **2 Hours**

Sitting: Summer 2014

Requirements for this examination:

Note to Candidates: Please check the Programme Title and the Module Title to ensure that you have received the correct examination. If in doubt please contact an Invigilator.

Question 1 – Total 20 marks.
Please place your answers for the MCQ into the answer book.

Question 1 Part A – MCQ – each question is worth 2 marks.

1.1. From the list below identify the functional area that is NOT associated with Spring:

a) Data Access
b) Web
c) Aspect Oriented Programming
d) Code expression

1.2. Spring containers are the core of a Spring container. With regard to these containers select from the list below the types of containers that are supported by Spring (there are 2 correct answers):

a) Application contexts defined by the **org.springframework.context.ApplicationContext** interface.
b) Spring containers defined by the **org.springframework.spring.Container** interface.
c) Bean factories defined by the **org.springframework.beans.factory.BeanFactory** interface.
d) Bean containers defined by the **org.springframework.beans.containers.BeanContainer** interface.

1.3. In order to over-ride the beans default singleton behaviour to ensure that a unique instance of a bean is returned each time it is asked for what scope should be declared for the bean (select one):

a) Scope=”not-singleton”
b) Scope=”prototype”
c) Scope=”unique-instance”
d) Scope=”only-one-instance”

1.4. Select the list below the term that best describes the term Dependency Injection.

a) It refers to sections of code that have to be included in many places with little or no alteration
b) It is a software design pattern that allows the removal of hard-coded dependencies and makes it possible to change them, whether at run-time or compile-time.
c) It is a Java object which does not follow any of the major Java object models, conventions, or frameworks.
d) It is a software design pattern that ensures the inclusion of hard coded dependencies at run-time.

1.5. Identify from the list below the application context flavour that is invalid:

a) ClassPathXmlApplicationContext
b) FileSystemXmlApplicationContext
c) SourceFolderXmlApplicationContext
d) XmlWebApplicationContext

Question 1 Part B – question is worth 5 marks.

A **Plain Old Java Object (POJO) acronym** is used to emphasize that a given object is an ordinary Java Object, and not a special object. With regard to POJOs list specifically the three things that a POJO should not have to do?

Question 1 Part C – question is worth 5 marks

Explain through the use of an example what is meant by the term '**boilerplate code**'. Identify how the Spring framework helps eliminate boilerplate code.

Question 2 – Total 20 marks.
Please place your answers for the MCQ into the answer book.

Question 2 Part A – MCQ – each question is worth 2 marks.

2.1. What is wrong with the following bean declaration?

```
<bean "SimpleBeanExample"
class="com.adfframework.labs.sillyshow.thehit.SongwriterImpl" lazy-init="true">
<constructor-arg name="name" value="Mary Jones"/> </bean>
```

a) Lazy-init needs to be set to false.
b) The constructor argument is incorrectly defined.
c) ID portion of the bean declaration is missing.
d) There is nothing wrong with it.

2.2. The developer wants to ensure that the same instance of a bean is returned each time it is asked for. In order to do this select the correct statement from the list below:

a) scope="singleton" needs to be defined as part of the bean declaration.
b) scope="prototype" needs to be defined as part of the bean declaration.
c) You do not have to do anything as the same instance of the bean is returned by default each time it is called.
d) Answer a) and c) are correct.
e) None of the above are correct.

2.3. How would you auto inject into a field by its name?

a) By using the @Autowired and @Qualifier spring annotations.
b) With the name attribute of the @Autowired.
c) By using the single @Qualifier annotation.
d) By using the @Autowire name.
e) None of the above

2.4. Identify from the list below the best statement that is associated with the @Component annotation.

a) You need to enable classpath scanning specifying the packages to read to see if the annotation exists in the POJO defined.
b) It creates a component that is associated with the service layer of the application.
c) In the event that a POJO whose class name is XYZ is annotated with @Component annotation this will create a bean whose name is XYZ in the container in Spring.
d) None of the above statements are correct.

2.5. Identify from the list below the best statement that explains 'autowiring' in Spring.

a) byName, byType and byUndetect are all types of autowiring.
b) It increases the amount of configuration reduced in XML.
c) It autowires relationships between collaborating beans without using `<constructor-arg>` and `<property>` XML elements.

d) Mixing automatic and explicit wiring is not allowed in Spring.

Question 2 Part B – question is worth 5 marks

Consider the example detailed below. Autowiring **byType** based on the example above generates an error. Specify the reason why this error occurred and identify a solution to the problem.

```
<bean id="account" class="Account">
   <constructor-arg name="accountNumber" value="1234"></constructor-arg>
   <constructor-arg name="accountBalance" value="10.22"></constructor-arg>
</bean>
<bean id="secondAccount" class="Account">
   <constructor-arg name="accountNumber" value="2345"></constructor-arg>
   <constructor-arg name="accountBalance" value="10022"></constructor-arg>
</bean>
<bean id="customer" class="Customer" autowire="byType">
   <property name="name" value="Mary Jones"></property>
   <property name="address" value="CIT, Cork"></property>
</bean>
<bean id="secondCustomer" class="Customer">
   <property name="name" value="Lucy Jones"></property>
   <property name="address" value="CIT, Cork"></property>
   <property name="account" ref="secondAccount"></property>
</bean>
```

Question 2 Part C – question is worth 5 marks

What is meant by the term component scanning?

Identify the annotations and stereotypes used to enable component scanning within Spring.

Question 3 – Total 20 marks.
Please place your answers for the MCQ into the answer book.

Question 3 Part A – MCQ – each question is worth 2 marks.

3.1 What data access technology is <u>not</u> supported by the Spring framework outlined below:

a) Jdbc
b) Hibernate
c) NoSQL
d) JPA

3.2 Using Springs Jdbc framework reduces the amount of work that the developer is now responsible for. From the list below select one or more items that the developer needs to perform when using Springs JDBC framework.

a) Process any exception
b) Prepare and execute the statement
c) Set up the loop to iterate through the results (if any)
d) Specify the statement
e) Do the work for each iteration

3.3 Using JdbcTemplate what is the name of the Spring provided class that you would use for result set parsing and merging rows into a single object. Select a unique answer.

a) RowMapper
b) ResultSetExtractor
c) ResultSetMapper
d) RowCallbackHandler

3.4 Identify from the list below an invalid transaction attribute:

a) Propagation
b) Isolation
c) Rollback
d) TimeAllowed
e) ReadOnly

3.5 Using JdbcTemplate batch processing is accomplished by implementing a special interface, `BatchPreparedStatementSetter`. Using this interface select the methods that you must implement as part of this interface.

a) getBatchSize
b) updateSet
c) setValues
d) batchUpdate

Question 3 Part B – question is worth 5 marks.

Using the code below select the error (if any) that exists.

```
public class SingerDAOImpl implements SingerDAO {
private DataSource dataSource;
private JdbcTemplate template;

.....
```

```
//some methods are not shown on purpose

public void create(String name, Integer age) {
   String SQL = "insert into Singer (name, age) values (:name, :age)";
   Map<String, Object> parameters = new HashMap <String, Object>();
   parameters.put("name", name);
   parameters.put("age", age);
   template.update(SQL, parameters);
   System.out.println("Created Record Name = " + name + " Age = " + age);
}
```

Question 3 Part C – question is worth 5 marks

The acronym ***ACID*** is used to describe transactions. Explain this acronym in detail.

Question 4 – Total 20 marks.
Please place your answers for the MCQ into the answer book.

Question 4 Part A – MCQ – each question is worth 2 marks.

4.1 Based on the list below order the Spring MVC work flow. The first item in the list should represent the item that occurs first in the flow and so on.

a) The client gets the generated response and the service is complete.
b) The controller uses the view.
c) HTTP request comes into the controller.
d) The controller accesses the model.

4.2 Based on the list below select the statement that best represents the purpose of Springs DispatcherServlet.

a) Front controller that dispatches requests to registered request handlers.
b) Back controller that returns responses to listeners.
c) It simply dispatches servlets to listeners.
d) None of the above.

4.3 What annotation would you use on method argument to bind it to the value of a URI template in Spring MVC?

a) @Path
b) @PathVariable
c) @Variable
d) @VariablePath

4.4 Identify from the list below the Spring security standard naming convention that is invalid when creating a custom login form:

a) j_spring_security_check
b) j_spring_security_logout
c) j_username
d) j_password
e) j_domain

4.5 Select the view resolver you need to use when using Apache tiles in your Spring MVC project.

a) InternalResourceViewResolver

b) UrlBasedViewResolver
c) TemplateBasedViewResolver
d) TilesResourceViewResolver

Question 4 Part B – question is worth 5 marks.

Using the code presented below state how Spring will resolve the view name called – logout – using the view resolver defined below.

```
<bean class="org.springframework.web.servlet.view.InternalResourceViewResolver">
        <property name="prefix
                <value>/WEB-INF/jsp/company</value>
        </property>
        <property name="suffix">
                <value>.jsp</value>
        </property>
</bean>
```

Question 4 Part C – question is worth 5 marks

Outline five key features of the Spring MVC framework.