INSTITUTE OF TECHNOLOGY BLANCHARDSTOWN

Year	Year 4
Semester	Semester 1 REPEAT
Date of Examination	**Friday 19th August 2011**
Time of Examination	**1.00pm - 3.00pm**

Prog Code	**BN402**	**Prog Title**	Bachelor of Science (Honours) in Computing	**Module Code**	COMP H4023
Prog Code	**BN104**	**Prog Title**	Bachelor of Science (Honours) in Computing	**Module Code**	COMP H4023

Module Title	Enterprise Computing

Internal Examiner(s): **Geraldine Gray**

External Examiner(s): **Dr. Richard Studdert**

Mr. John Dunnion

Instructions to candidates:

1) To ensure that you take the correct examination, please check that the module and programme which you are following is listed in the tables above.
2) The paper consists of five questions. Candidates should complete ANY FOUR of the five questions.
3) The paper is worth 100 marks. Each question is worth 25 marks.

DO NOT TURN OVER THIS PAGE UNTIL YOU ARE TOLD TO DO SO

Question 1

a) Developing a web application using EJB's as per the JEE specification is more difficult than using a simple 3-tier architecture with, for example, JSP, managed beans and a database. Explain in what circumstances it would be advisable to use a JEE architecture. Your answer should refer to a range of benefits of using JEE, illustrated by reference to case studies.

15 marks

b) Explain the concept of an Enterprise Service Bus, and how it facilitates a Service Oriented Architecture.

10 marks

Question 2.

a) A session bean can be defined as stateless, stateful or singleton. Explain the role of a session bean in a JEE architecture, and the difference between the three types of session bean. Also explain the implication of your choice of session bean on resource management.

13 marks

b) Read the following business scenario and answer the related questions:

To pay your TV licence online, you must first enter your customer ID and online pin. Once these are verified, you can then enter payment details (name, address and credit card details). If the credit card details are valid you will receive an online confirmation including a transaction reference number.

You have been asked to implement this scenario using a JEE architecture.

i) Identify the entity beans needed. Suggest appropriate attributes for each entity bean.

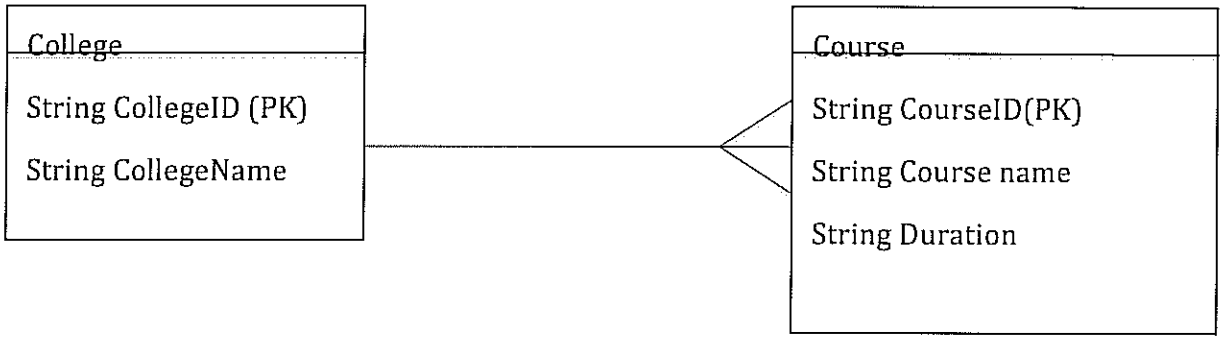
2 marks

ii) How many session beans would you recommend? For each session bean, give pseudo code for the business logic it would need to implement. (Note: you do not need to include linking to a persistence unit, or creating an entity manager)
For each query needed, decide if it should be a static or dynamic query, and justify your selection.

10 marks

Question 3.

a) Write the entity bean code for the following two entities representing a college and a course table. Assume the relationship is one to many and bidirectional. You just need to include the attribute definitions in your code, you do not need to include any methods in your answer.



10 marks

b) Explain optimistic locking, and how it is implemented in the Java Persistence API. What changes would you need to make to the entity beans given in answer to part a) above to implement optimistic locking?

10 marks

c) Write a JPQL query for each of the following, based on the college and course entities given in part a) above.

i) List all course names. **2 marks**

ii) Give the course name and college name for each course. **3 marks**

Question 4.

a)

recommendBook.html	process.jsp

<form action="process.jsp">
Who is your favorite author?
<input type="text" name="author"/>
<input type="submit" value="Continue"/>
</form>
	//initial HTML
	<%
	//read input parameters
	%>
	 People who like <%= author %>
	also purchased books by the following
	authors
	// rest of code. . .

Explain in detail one type of attack the code above is vulnerable to, and the possible impact of such an attack. Recommend amendments to the code which would prevent such an attack.

10 marks

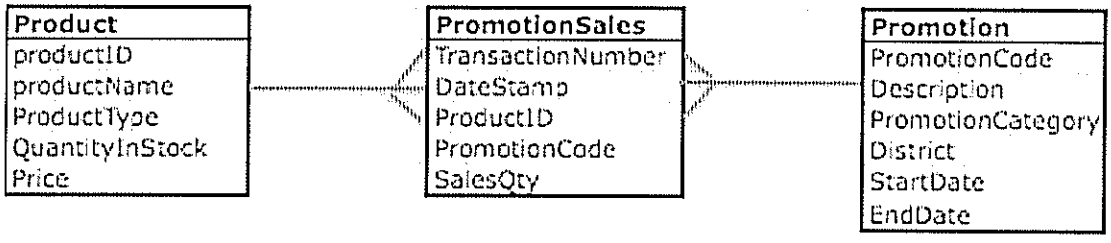
b) You have been asked to advise a company on how to set up their security requirements for a JEE application, developed using Netbeans, and running on Glassfish. There will be ten people using the system, broken down into the following groups: two people from sales, five people from distribution and three managers. Each group has access to different areas of functionality.

Write a report which details the steps needed to set up these users on Glassfish and to restrict their access to session bean functionality. Explain all security related terms used in your report.

15 marks

Question 5.

a) Convert the following ERD to a star schema which has one measure, *SalesQty*, and **four** dimensions. For each dimension, recommend a possible concept hierarchy.



13 marks

b) Discuss what factors one should consider when deciding which aggregates to pre-compute.

8 marks

c) The optimal index for a Data Warehouse is a bit map index. However it is not suitable in all cases. Explain the type of attribute, and the type of environment, that a bit map index is best suited to.

4 marks