University of Swaziland

Department of Computer Science

Final Examination

2015/16

Title of Paper: Software Engineering II

Course Number: CS452

Time Allowed: Three (3) hours

Instruction: **ANSWER ALL QUESTIONS**

You are not allowed to open this paper until you have been told to do so by the invigilator.

Question 1

a) Name 7 artifacts that are normally produced by software testing.   [7]

b) Write a complete test plan for the scenario below.   [18]

Banking applications are considered the most complex applications in today's software development and testing industry. With the continent of Africa making major strides technologically and thousands of previously unbanked Africans becoming banked, a bank in Nairobi, Kenya decided to revamp its current banking system. They hired a top software development firm in Singapore, Triple T, to carry out this project. Triple T agreed to do the project yet they already had other big projects which they had already taken up so they had to ask their sister company in India, Triple V, to help them do this. English is one of the official languages in all three countries (Singapore, India and Kenya). After reaching an agreement with Triple T, the bank furnished Triple T with some of the characteristics of the system, namely:

- Multi-tier functionality to support thousands of concurrent user sessions
- Large scale integration, typically a banking application integrates with numerous other applications such as Bill Pay utility and Trading accounts
- Complex business workflows
- Real time and batch processing
- High rate of transactions per seconds
- Secure transactions
- Robust reporting section to keep track of day to day transactions
- Strong auditing to troubleshoot customer issues
- Massive storage system
- Disaster management

Question 2

a) Discuss the following in detail:

- Usage Profiles   [7]

- Task Profiles   [5]

b) State the advantages of the following interaction styles:

- Menu selection   [4]

- Form fillin   [3]

- Command language   [3]

- Direct manipulation   [3]

Question 3

a) Name four constructs of an object-oriented (OOA) model.   [4]

b) Draw an object-oriented (OOA) model for the VIP cosmetics company described below.   [21]

VIP cosmetics

VIP cosmetics is a successful network sales company. The company sells a variety of health and beauty products through selected distributors. A distributor is a person who has committed himself to selling the products of the company. The distributors then sell to the general public. VIP keeps a list of all its distributors. This list details the distributor name, postal address and other essential details.

Distributors buy products by placing orders with VIP head office. The order contains a list of items that the distributor wants to buy. This list details the product identity code and the quantity being ordered. The total cost for each order item may also be computed by multiplying the quantity by the product price. The product price may be obtained from a list of all the products. This list details the product code, name, description and price. The total cost of each order may be computed by summing the cost of each item on the order.

Distributors receive a discount depending on how many points they have accumulated since joining VIP as a distributor. The number of points is proportional to the accumulated total cost of their orders. For example, if they place an order costing E200 they receive an extra 200 points. Distributors who have just joined VIP receive 30% discount. Distributors who have accumulated 2 500 points receive 35% discount, 10 000 points receive 40% discount, 20 000 points receive 44% discount, 40 000 points receive 48% discount and 80 000 points receives 52% discount.

VIP requires a software system that will help their head office personnel in processing the orders. On receiving an order they want to be able to quickly calculate the item cost, the gross total cost for each order and the discounted cost for each order. They also want a system that will keep track of the accumulated points for each distributor and hence making it easy to calculate the discount.

Sometimes they want to view the list of distributors, orders and products. This listing must be selectable such that when a distributor is selected, the order list for the distributor is also visible. In turn this order list must be selectable such that when an item is selected on the order list the product details are also visible.

Question 4

a) State and discuss any form of coupling that is moderately desirable.   [5]

b) State and discuss any form of cohesion whose desirability is quite high.

   [4]

c) Discuss the distinction between activation control coupling and coordination control coupling.   [4]

d) When are modules said to have content coupling?   [4]

e) Lack of compatibility is said to be one of the main causes of software failure. Discuss:

   i.   Software compatibility.   [4]

   ii. Causes of incompatibility.   [4]

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