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**JOMO KENYATTA UNIVERSITY**

**OF**

**AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2014/2015**

**YEAR II SEMESTER II EXAMINATION FOR THE DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY**

**BBT 2205: OBJECTED ORIENTED ANALYSIS AND DESIGN**

**DATE: AUGUST 2015 TIME: 2 HOURS**

**INSTRUCTIONS: ANSWER ONE QUESTION IN SECTION I AND ANY OTHER TWO QUESTIONS**

**QUESTION ONE (30 MARKS)**

1. Consider a monitoring application whose GUI is depicted in the Fig. one below.

The application is used in a bakery to control two ovens (lets say, one for cooking cookies and the other for bread). This application receives events from each oven (turned on/off, temperature change) which it displays on the thermometers shown.

In case an oven is off, its group of GUI elements must be grayed out. The monitoring application must keep timers in order to fire an alarm whenever any of the ovens has been on without interruption for more than 15 min at a temperature of 2500C or higher. The monitoring application itself sends no signals to the ovens, it lacks all control functions.

Prepare

1. The class diagram for the ovens and the monitoring application. [8 marks]
2. The state chart for the monitoring application to update the GUI [8 marks]
3. A master student can take courses at the JKUAT. Courses can be lectures or Lab classes. Each master student must take at least one course. Each course is held by a research department. Each research department has at least one professor and 0 to 30 research assistant. Students, professors and research assistants have a lot in common. They have a name, a first name and a date of birth.

**Required:**

1. Which diagram type should be used to describe this scenario? [3 marks]
2. Draw such a diagram for this scenario [6 marks]

(c) Describe the diagram types that can be used to describe the following scenarios;

1. Behaviour of an object
2. Interaction between different objects
3. Life-cycle dependencies of objects
4. Organization of a large amount of data
5. Behaviour over time [5 marks]

**QUESTION TWO (20 MARKS)**

Construct a design elements of;

1. Use case diagram
2. Activity diagram
3. Sequence diagram
4. Class diagram

For a point of sale terminal management system that can be used for buying and selling of goods in the retail shop. When the customer arrives at the past check point with the items to purchase. The cashier records each item, price and adds the item information to the running sales transaction. The description and price of the current item are displayed. In completion of the item entry the cashier informs the sales total and tax to the customer. The customer chooses payment type (cash, cheque, credit or debit). After payment is made the system generates a receipt and automatically updates the inventory. The cashier hands over the receipt to the customer. [20 marks]

**QUESTION THREE**

The following is a description of a system. Draw a UML class diagram to represent the structural model.

A University offers a number degree programmes, which are classified into Bsc. (Hons) degree programme, MSc degree program and PhD degree programme. To teach students in various programmes, the University runs a number of course modules. A particular or compulsory to a program or not acceptable at all to the program.

Each Bsc (Hons) degree programmee contains a number of modules as acceptable or compulsory, which are classified into stage I modules, advanced modules and honours modules.

For a student who studies a Bsc (Hons) degree programme in order to obtain the degree he/she must complete a study plan that consists of a least 8 stage I modules, 16 advanced/honours modules and 4 honours modules that are acceptable to the programme.

[20 marks]

**QUESTION FOUR (20 MARKS)**

Consider an automated trading house system with the following features;

* The trading house has transactions with two types of customers, individual customers and corporate customers.
* Once the customer places an order it is processed by the sales department and the customer is given the bill
* The system allows the Manager to Manager customer accounts and answer any queries posted by the customer.

**Required:**

1. Develop a Use Care diagram for the Automated Trading Systems
2. Develop a sequence diagram for the Automated Trading House system
3. Develop an activity diagram for the Automated trading House system
4. Develop a collaboration diagram for the Automated Trading House System [20 marks]

**QUESTION FIVE (20 MARKS)**

1. Though a secondary products a good documentation is indispensable, particularly in the SIX main areas. Describe the SIX areas. [12 marks]
2. Describe the differences between model – Driven Development and Test- Driven Development and indicate under which condition it is appropriate to use each. [8 marks]