FINAL EXAMINATION
FIRST SEMESTER SESSION 2013/2014

COURSE CODE / NAME : STID 3024/SYSTEM ANALYSIS AND DESIGN
DATE : 2 JANUARY 2014 (THURSDAY)
TIME : 9:00 – 11:30 A.M. (2 ½ HOURS)
VENUE : DSB K.MAS, KYM, KISDAR

INSTRUCTION :

1. This book script contains SECTION A and SECTION B. SECTION A contains FOURTEEN (14) questions and SECTION B contains FOUR (4) questions in TWELVE (12) printed pages excluding the cover page.
2. Answer ALL questions in the space provided.
3. You are not allowed to remove the examination paper from the examination hall.

MATRIC NO : ____________________________ (with word) ____________________________ (with number)
IDENTIFICATION CARD NO : 
LECTURER : ____________________________
GROUP : [ ] TABLE NO : [ ]

DO NOT OPEN THIS EXAMINATION PAPER UNTIL INSTRUCTED

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SECTION A: STRUCTURED QUESTIONS (60 MARKS)
Instruction: Answer ALL questions in the provided spaces.

1. List TWO (2) purposes of analysis and design. (2 marks)

2. List TWO (2) advantages of Object Oriented Approach. (2 marks)

3. Discuss TWO (2) differences between functional and non-functional requirements. (4 marks)
4. Tick (v) the category of each requirement listed below: (4 marks)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Icons and letters must be large enough for the customer to recognize without having to get too close.</td>
<td></td>
</tr>
<tr>
<td>b) Airline agents around the world must be able to reserve seats for flights from any origin to any destination.</td>
<td></td>
</tr>
<tr>
<td>c) A registration clerk can enter or update a patient’s personal data.</td>
<td></td>
</tr>
<tr>
<td>d) A billing clerk can maintain patient billing.</td>
<td></td>
</tr>
</tbody>
</table>

5. Give **TWO (2)** situations when each diagram below is suitable to be used. (4 marks)

   a) Activity diagram

   b) Sequence diagram

6. There are two types of relationships between use cases; include and extend. Describe **ONE (1)** main difference for each relationship. (4 marks)
7. Develop an activity diagram based on the following narrative:

"The diagram should have three swimlanes to show the business process of the Open Access Insurance System between Prospective Customer, Insurance Agent and Insurance Company. The purpose of the Open Access Insurance System is to provide automotive insurance to car owners. Initially, prospective customers fill out an insurance application, which provides information about the customer and his or her vehicles. This information is sent to an agent, who sends it to various insurance companies to get quotes for insurance. When the responses return, the agent then determines the best policy for the type and level of coverage desired and gives the customer a copy of the insurance policy proposal and quote."

(6 marks)
8. Construct a class diagram for the following description:

Vehicles have some common attributes (speed and colour) and common behaviour (turnLeft, turnRight). Bicycle and MotorVehicle are both kinds of Vehicle and are therefore shown to inherit from Vehicle. To put this another way, Vehicle is the superclass of both Bicycle and MotorVehicle. In our model MotorVehicle have engines and license plates. Attributes have been added accordingly, along with some behaviour that allows us to examine those attributes. MotorVehicle is the base class of both MotorBike and Car, therefore these classes not only inherit the speed and colour properties from Vehicle, but also the additional attributes and behaviour from MotorVehicle. Both MotorBike and Car have additional attributes and behaviour which are specific to those kinds of object.

(8 marks)
9. State **TWO (2)** criteria for good design. 

(2 marks)

10. Draw a state machine diagram that captures possible invoice states for the following scenario:

The initial state of Invoice is unpaid. There are two possible transitions out of the unpaid state. On the partial payment event, the invoice object goes into the partly paid state. Only one partial payment is allowed. The final payment event happens when in an unpaid or partly paid state and fires transitions to the fully paid state. This is the final state.

(7 marks)
11. The goal of user interface design is to make interface pleasing to the eye and simple to use, while minimizing the effort the user need to accomplish their work. Navigation design must be designed properly to make system as simple as possible to use. List **THREE (3) types of messages in navigation design.**

(3 marks)

12. Coupling and cohesion are two factors that could be emphasized in breaking systems into modules to ensure that they are easy to develop and maintain. Describe good coupling and cohesion. Give **ONE (1) example for each factor.**

(6 marks)
13. Software documentation consists of system documentation and user documentation. Explain TWO (2) advantages of software documentation. (4 marks)

14. Phased Change Over and Single Location/Pilot study are types of installation. Complete the following table to show differences between Phased Change Over and Single Location/Pilot Study.

<table>
<thead>
<tr>
<th></th>
<th>Phased change over</th>
<th>Single location/Pilot study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small/big scale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time to develop</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(4 marks)
SECTION B: CASE STUDY QUESTIONS (40 MARKS)

Instruction: Answer ALL questions in the provided spaces.

Understand the following case:

What do you want to do with your used items, like clothes, devices and furniture? TradeMe is a popular e-commerce site in New Zealand which provides a platform for users to buy and sell their second hand items. Figure 1 shows the main page of TradeMe.

To use TradeMe, users have to be a registered user; either as a normal user or an exclusive user. Normal user can just buy items available on TradeMe, while as an exclusive user, they can buy and put their items on TradeMe to be sold. Membership fee for an exclusive user is just NZD10 for the whole life.

To buy items listed on TradeMe, auction system is applied. Once logged in, user can view their preferred item based on category or its price. They can bid for the best price of the items. If they win the bidding, they can buy the item. Notification email will be sent to them guiding them with the purchase. They can pay using online banking of credit card. Users can also choose to include seller in their favourite list for new purchase in the future.

For exclusive user, the buying process is the same. To sell their items, they need to upload photos of the items, set its price and closing date for auction. Once the item is sold, notification email will be sent to them stating details of the buyer for postage purpose.
As a system analyst, you are required to understand the above description of TradeMe and answer the following questions.

1. Based on the case given, design a use case diagram to show all processes and parties involved. 

(10 marks)
2. Draw a sequence diagram to show a purchase process involved. Normal user will be a buyer for exclusive user.

(10 marks)
3. Exclusive user can be a seller selling their items, and at the same time can be a buyer to other exclusive member. Based on the sequence diagram in Question 2, draw a communication diagram showing all processes involved for exclusive user.

(10 marks)
4. Draw a class diagram for the given case. Show operations in classes and relationship between classes.

(10 marks)

END OF QUESTIONS