FINAL EXAM
FIRST SEMESTER SESSION 2011/2012

COURSE CODE / NAME : STID3023 / SYSTEM ANALYSIS AND DESIGN
DATE : 18 JANUARY 2012
TIME : 9.00-11.30 A.M (2 HOURS 30 MINUTES)
VENUE : TE

INSTRUCTION :

1. This paper contains SECTION A (70 marks) AND SECTION B (30 marks) in TWELVE (12) printed pages excluding cover sheet.
2. Answer ALL the questions in the space provided.

MATRIC NO : ____________________________   (with word)
            (with number)
IDENTIFICATION CARD NO. :
LECTURER : ______________________________
GROUP :  □  TABLE NO. : __________

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SECTION A: SHORT QUESTIONS (70 MARKS)

1. Briefly explain what is analysis and design in system development? (2 marks)

2. The reason why we use prototyping in a system development process is_______. (2 marks)

3. Describe the differences between Open- and Closed-Ended questions and indicate the primary purpose of each type. (4 marks)
4. Describe **TWO (2)** advantages of document sampling in fact finding context.  

(4 marks)

5. What is behavioral modeling language, give **ONE (1)** example of a behavioral diagrams.  

(2 marks)

6. Give **ONE (1)** purpose of use case diagram.  

(2 marks)

7. Based on the following diagram, write down the correct explanation .

a.  

```
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(2 marks)
8. Based on the following description, construct an activity diagram.
A salesperson calls the client and sets up an appointment. If the appointment is onsite (in the consulting firm's office), corporate technicians prepare conference room for a presentation. If the appointment is offsite (at the client's office), a consultant prepares a presentation on a laptop. The consultant and the salesperson meet with the client at the agreed-upon location and time. The salesperson follows up with a letter. If the meeting has resulted in a statement of a problem, the consultant creates a proposal and sends it to the client.

(8 marks)
9. Construct a class diagram from the following description.

All 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 MotorVehicles have engines and license plates. Attributes have been added accordingly, along with some behaviour that allows us to examine those attributes. MotorVehicles 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)
10. State machine diagram is one of the behavioural modeling diagram. Define briefly what is state machine diagram.

(2 marks)

11. The status of an employee from the time the employee is hired to the time he or she quits, is fired, or retires. Notice that the employee is a prospective employee is a FUTURE employee until all physicals are passed and all paperwork is processed, and then he or she becomes a CURRENT employee. Once employment ends for any reason, the individual becomes a PAST employee. Draw the state diagram based on the above scenario.

(7 marks)
12. Based on the following figure, label the interface components in the box provided.

(3 marks)

13. Design ONE (1) interface for the following type of message.

a. Error Message

(2 marks)

b. Confirmation Message

(2 marks)
14. What do you understand with the terms of cohesion and coupling in software design?  
(2 marks)

15. The following class is possibly lack cohesiveness. Redraw this class so that it is highly cohesive.  
(8 marks)

```
CourseRegistration
studentName
studentNumber
studentMajor
studentAddress
courseCode
courseTitle
lecturerID
lecturerName
lecturerDepartment
```
16. Installation is the organizational process of turning over from the old information system to the new one. Explain **FOUR (4) types** of installation. (8 marks)
SECTION B: CASE STUDY (30 MARKS)

Read the case study below and answer the following questions.

You are required to develop a system for Klinik Pakar Perubatan Mahang. This system is designed to help the clinic in managing their patient registration, diagnose the patient, provide prescription and payment. This system is known as Mahang Specialist Clinic System (MSCS).

MSCS will use a smart card that contains a chip to program all the patient information, such as their biodata, health, medication and payment. For all the registered patient who come back to get the service, they need to bring their smart card as an identification card.

• Register Patient

For every new patient, he or she needs to fill in a biodata form prepared by the clinic staff. Then the clinic staff will key in all the information in MSCS. The information are name, identification card number, contact address, telephone number and others related data. The clinic staff keeps all the information into the system. Then, the system generates the identification number for the patient and keeps it in the smart card. This smart card is given to the patient for future reference. For registered patient, they need to bring their smart card and give it to the clinic staff. Then, the clinic staff key in the identification number to register the patient. After registering the patient, the system generates a set of number to every patient based on first come, first serve basis in order to wait for consultation session.

• Diagnose patient

When a patient sees the doctor, the doctor will scan the patient's smart card and the system displays patient record. After the doctor completely diagnoses the patient, the doctor will update the diagnose information, medication needed, food diet as well as other related information. All the information is kept in the system. This information can only be accessed by the doctor, unless for the medication information that can be accessed by the pharmacist.

• Supply medication

After the consultation, the patient will wait for their turn to get the medication. The pharmacist will check the medication prepared by the doctor in the system. The system display a list of medicines and the bill. After the pharmacist hand over the medicine to the patient, the system will update the stock quantity based on the prescription.
• Payment

Based on the price displayed by the system, the patient needs to make the payment via credit card or cash. After the payment is made, the clinic staff will update the payment information for that patient. Then, the system will reset the number for that patient to zero.

1. Draw a Use case Diagram to show the Use Cases and Actors for the MSCS system. 

   (10 marks)
2. Draw a sequence diagram for the given use case specification. You have add any boundary, control or entity classes that you think are necessary.

FLOW OF EVENT

Basic Flow (MSCS_01_01)
- This use case begins when the clinic staff presses the 'Registration' button.
- The system shall display Registration Panel on the screen.
- The clinic staff will key in all the information (name, ic no., card no., address, phone no.) in the system and press submit button.
- The system will check all the required information and save it. (E-1: Incomplete information).
- The system will generate the identification number for the patient and keep it in the smart card.
- The system will generate a consultation number to the patient and display the number on the Registration panel.

(13 marks)
3. Sketch Class Diagram (with attributes, operations, and relationships) based on your answer in question 2.

(7 marks)