

**NJIT University**

**CIS 490 – 102**  
*Guided Design in Software Engineering*

**Instructor: Osama Eljabiri**

**Spring 2002**

**Final Exam**

**Name:**

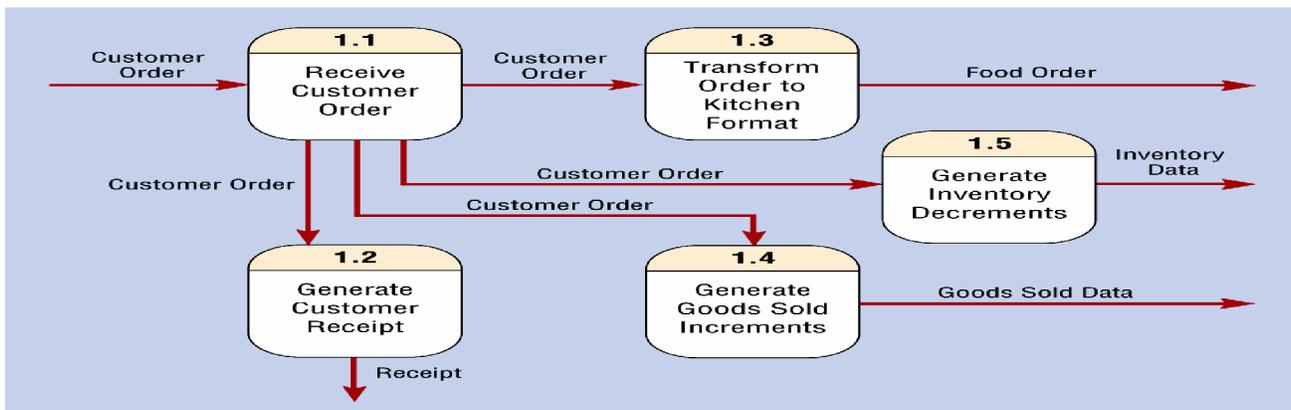
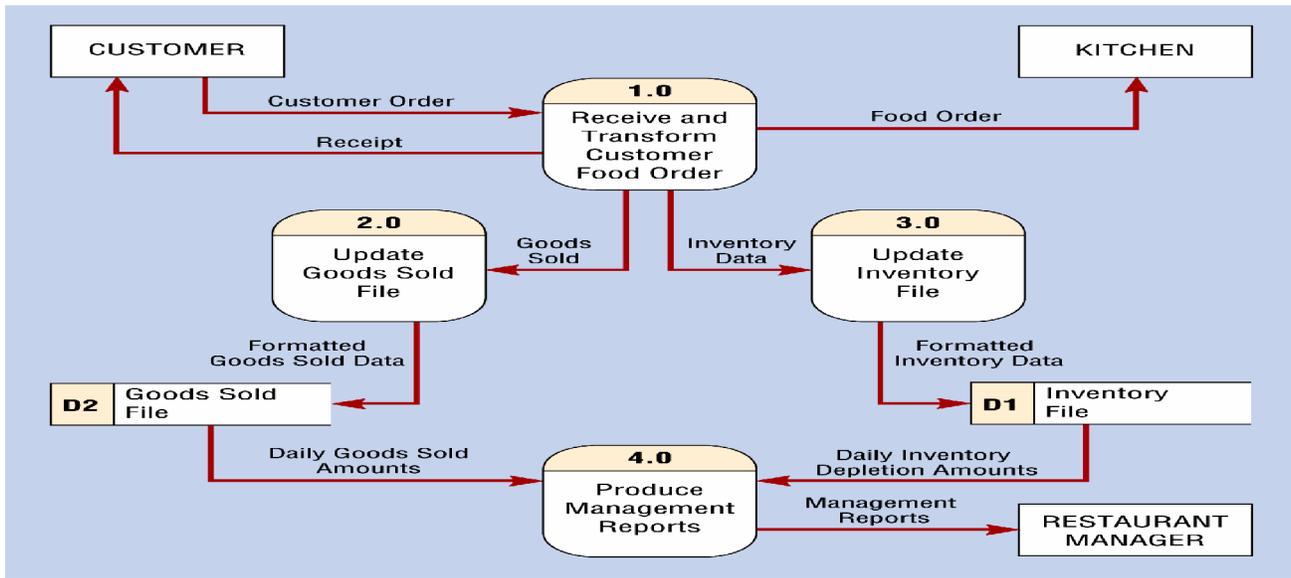
**Student ID:**

**Date:**

**Signature:**

Q1	Q2		Q3	Q4	Out of (100)
	20 points				
40 Points	Part #1 15 points	Part #2 5 points	30 Points	30 Points	Max 120

**Question 1: (40 points)**



1- Draw the correspondent **CONTEXT** diagram showing all possible components **(10 points)**

2- If the following steps should be followed to accomplish “**produce management reports**” process:

- A- Access goods and inventory data
- B- Aggregate goods sold an inventory data
- C- Prepare management reports that encompasses two steps:
  - C.1 – Format management reports
  - C.2 –Print management reports

Draw all relevant **DECOMPOSTIONS** that represent this information. **(10 points)**

3- Draw a **STRUCTURE CHART** that represents **all the diagrams** above **including your answer in (2)** showing all possible components **(20 points)**

**Question 2 : (20 points)**

**A- Construct a DECISION TREE for the following decision table (15 points):**

Conditions	1	2	3	4	5	6	7	8
1. Avg. Checking Balance at least \$1000	Y	Y	Y	Y	N	N	N	N
2. Avg. Number of Overdrafts no more than 2	Y	Y	N	N	Y	Y	N	N
3. Avg. Savings Balance at least \$500	Y	N	Y	N	Y	N	Y	N
Actions								
1. Approval	X	X						
2. Conditional Approval			X		X			
3. Rejection				X		X	X	X

**B- You are designing an automated ordering system for a restaurant with the following menu: (5 points)**

**LUNCH TIME MENU**

Choose one appetizer, one entree, one dessert, and **one optional drink**.  
NO SUBSTITUTIONS PLEASE!

**Appetizers | Entree: | Dessert: | Drink:**

Fruit | Cow | Fruit | Coke  
 Salad | Pig | Candy | Water  
 Soup | Bird | Cake | Milk  
 Bread | Veggie | |

Complete the following data dictionary definitions :

1. Lunch-menu-order =
2. Appetizers =
3. Entree =
4. Dessert =
5. Drink =

**Question 3: (30 points)**

Make a **STATIC OBJECT DIAGRAM** for NJ Vehicle Registration Department. The following information is available:

The Vehicle Registration Department must keep data about the Clerks, Owners, Vehicles and Registrations. Clerk objects are characterized by Name, SSN, Position, and Languages-spoken. They provide a service called Registration. Vehicle objects have Vehicle ID, Make, Model, Year, and Color. Owners are identified by their Names, Address, and Telephone-number. There are **ONLY** two types of owner: Person-Owner and Business-Owner. In addition to the above attributes, a Person-Owner has a SSN attribute while a Business-Owner has a Business-ID attribute. An Owner owns one or many Vehicles. A Vehicle is owned by one and only one Owner. Any Registration is issued for a specific Owner and Vehicle; it is issued on a specific Date and has an Expiration Date attribute.

Please note the following:

- 1- Use only UML notations
- 2- State explicitly any assumptions you make

**Q4: (30 Points)****Part –1: Circle the letter of the only correct answer (5 X 1=5 points):**

1- What is the preferred combination with respect to coupling and cohesion in software design?

- a. High coupling and high cohesion.
- b. High coupling and low cohesion.
- c. Low coupling and high cohesion.
- d. Low coupling and low cohesion.
- e. No coupling or cohesion.

2- Defining a class that gets most of its properties and methods from another class is called :

- a) Inheritance
- b) Instantiation
- c) Polymorphism
- d) Encapsulation

3- A specific car that was a Toyota Camry would be an object of a hierarchy of classes. Which of these would be the correct hierarchy, starting with the top super class down to more specific classes?

- a) Car - Toyota - Camry
- b) Camry - Toyota - Car
- c) Toyota - Camry - Car
- d) Toyota - Car - Camry

4- Here is a problem-

“A thermostat controls the heating/cooling system in a house. There are temperature sensors in each room. Each room can have a desired temperature set by the people in the room”

At the first step of object design, the \_\_\_\_\_ would be identified as potential objects

- a) Verbs (such as "controls")
- b) Nouns (such as "thermostat")
- c) Adjectives (such as "hot")
- d) Prepositions (such as "in")



e) Show in drawing an **ERM model** for the **registration system** at NJIT using all standard notations (at least FOUR entities) ? (4 points)

f) What do we mean by the following abbreviations: (4 points)

COTS:

CASE:

BPR:

UML:

**Good Luck,**