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SCHEDULE I / ITEM 5   **March 2006**

DATA BASE MANAGEMENT SYSTEMS (INFORMATICS)

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Note: This examination consists of 7 questions on 1 page.   **Marks**

Q. No	Time: 3 hours	Value	Earned

1	For the following relational database structure, draw the implementation schema graphically. Identify every primary key and every foreign key. For each key, explain what they are used for.
	   a) BUILDING (address, use, value, height, parcel number)
	   b) PERSON (name, Social Security Number, date of birth)
	   c) PARCEL (cadastral number, area, value)
	   d) OWN (building address, date of transaction, price, person SSN)
	   e) LIVE (building address, person SSN)
		15	

2	For the previous relational database structure, do the reverse engineering process and draw the conceptual schema that might represent the semantics of this database. You can draw a UML object-class diagram or an Entity/Relationship diagram.	10	

3	In the previous database implementation, is it possible to answer the following questions? If no, explain why. If yes, write the appropriate SQL query. (In cases where you are unsure because you make an assumption about a potential real life situation, describe the assumption used).
	   a) How many buildings are there on parcel 123 ?
	   b) What is the name of the owner(s) of parcel 123 ?
	   c) What is the total value of the buildings owned by John Smith ?
	   d) What is the address of the persons who own a building in our city while living into another city?
	   e) List all companies that own a building.
		25	

4	Which improvements would you make to the previous relational database structure to be able to answer every query of Question 3? First, improve your conceptual schema. Then, improve the implemented relational data structure.	14	
5	What are integrity constraints? Give an example for the following integrities: domain, referential, not null, cardinality, and datatype.	10	
6	What are spatial integrity constraints? Give 3 examples.	6	

7	Give a definition for each of the following:
	   a) Database Management System
	   b) Unified Modeling Language
	   c) Data Warehouse
	   d) Distributed Database
	   e) Interoperability
		20	

	Total Marks:	**100**	