King Fahd University of Petroleum and Minerals

Information and Computer Science Department

ICS 541: Database Design & Implementation

DO NOT OPEN UNTIL INSTRUCTED TO DO SO!!!!

Write clearly, precisely, and briefly!!

ID:						
Name:						

Grades		
Section	**Max**	**Scored**
A	**12**	
B	**12**	
C	**18**	
TOTAL	**42**	

A. Questions from the paper of home work 1 (Bridging XML-Schema and relational databases …. [12 points]

1. Briefly explain how the mapping of the following types is explained on the paper.

a) Attributes

b) AttributeGroups

c) SimpleTypes

d) ComplexTypes

B. Questions from the second home work paper: Relational Databases for Querying XML documents: Limitations and Opportunities.

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<!ELEMENT  course(title, lecturer*, coordinator)>
<!ELEMENT  section(code, lecturer)>
<!ELEMENT  prerequisite(title, lecturer, condition)>
<!ELEMENT  condition(prerequisite*)>
<!ELEMENT  lecturer(name, office)>
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<!ATTLIST  coordinator lectureid IDREF IMPLIED>
<!ATTLIST  condition name CDATA #REQUIRED>
<!ATTLIST  lecturer id ID #REQUIRED>
```

a) Draw the DTD graph of the above shown DTD **[4 points]**

b) Map the above DTD into relational schema using the hybrid inlining technique. Explain all your steps **[8 points]**

C. Questions from Chapter 11.

1. What is the number of disk access done to sort a file of size 100 blocks, if the size of the memory allocated for sorting the file is 8 blocks. Explain your solution step by step showing in each step how many disk accesses are done. Don't use the formula that is in your lecture slide. **[12 points]**

2. Briefly explain 3 techniques of accelerating access to secondary storage.
[6 points]