Tutorial 10 (Solution)
SQL+XML

Classroom Exercise

Question 1

#	1	2	3	4	5	6
Faster	X		X	X	X	
Same		X				X

Question 2

(i)

Create index a on student (age);
Select id
From student
Where age = 20;

(ii)
Create index a on student (sex, age);

Question 3

Any specific example illustrating all the rules will do.

```
<emp>
    <ename> John Jensen</ename>
    <children>
      <name> Peter Jensen</name>
      <birthday>
            <day>15</day>
            <month>August<month>
            <year>2017</year>
      </birthday>
```

```
        </children>
        <skills>
                <type>C++</type>
                <exams>
                        <year>2018</year>
                        <city>Singapore</city>
                </exams>
        </skills>
</emp>
```

Question 4

Part (i)

```
<!DOCTYPE courses [
<!ELEMENT courses (course*)>
<!ELEMENT course (name, instructor, room, student+)>
<!ELEMENT student (name, email, grade)>
<!ATTLIST course cid  ID #required>
<!ATTLIST student sid  CDATA #required>
<!ELEMENT name (#PCDATA)>
<!ELEMENT instructor (#PCDATA)>
<!ELEMENT room (#PCDATA)>
<!ELEMENT email (#PCDATA)>
<!ELEMENT grade (#PCDATA)>
]>
```

Part (ii)

```
Student
sid     name            email
s01     Jim Halpert     j.halpert@cis.upenn.edu
s02     Dwight Schrute  schrutefarms@cis.upenn.edu
s03     Nelly Bertram   n.bertram@cis.upenn.edu

Course
cid         name                instructor      room
CIS550      DBMS                Dr. Davidson    SKIRAUD
CIS552      Advanced Programming Dr. Weirich     TOWNE321
CIS500      Software Foundations Dr. Pierce      MOORE216

Enrolls
sid     cid     grade
s01     CIS550  A
s01     CIS552  A
s02     CIS550  B+
s02     CIS500  B-
s03     CIS550  A-
```

```xml
<?xml version="1.0"?>
<!DOCTYPE courses SYSTEM "courses.dtd">
<courses>
  <course cid = "CIS550">
     <name>DBMS</name>
     <instructor>Dr. Davidson</instructor>
     <room>SKIRAUD</room>
     <student sid = "s01">
        <name>Jim Halpert</name>
        <email>j.halpert@cis.upenn.edu</email>
        <grade>A</grade>
     </student>
     <student sid = "s02">
        <name>Dwight Schrute</name>
        <email>schrutefarms@cis.upenn.edu</email>
        <grade>B+</grade>
     </student>
     <student sid = "s03">
        <name>Nelly Bertram</name>
        <email>n.bertram@cis.upenn.edu</email>
        <grade>A-</grade>
     </student>
  </course>
  <course cid = "CIS552">
     ......
  </course>
</courses>
```