Introduction to XML

1) Write the DTD element declaration for the following description:
   - An employee has the following information: name, surname, identification number, postal address, telephone number, and email address.
   - The name and the surname are mandatory.
   - The identification number is optional.
   - The postal address is optional.
   - An employee may have zero or more telephone numbers.
   - An employee may have one or more email addresses.

2) Explain the following XML declaration:
   ```xml
   <!ATTLIST student
       number ID #REQUIRED
       course ("1"|"2"|"3"|"4"|"5"|"Doc") #IMPLIED
       foreigner ("Yes"|"No") "No">
   ```

3) Write a DTD and a sample XML document for documents that store information about countries: name, capital, population (optional), international telephone code (optional), and Internet domain extension (optional).

4) Write a valid XML document for the following DTD:
   ```xml
   <!ELEMENT DOCUMENT (TITLE, SIGNATURE)>
   <!ELEMENT TITLE (#PCDATA)>
   <!ELEMENT COPYRIGHT (#PCDATA)>
   <!ELEMENT EMAIL (#PCDATA)>
   <!ELEMENT BR EMPTY>
   <!ELEMENT HR EMPTY>
   <!ELEMENT LAST_MODIFIED (#PCDATA)>
   <!ELEMENT SIGNATURE (HR, COPYRIGHT, BR, EMAIL, BR, LAST_MODIFIED)>
   ```

5) Write a valid XML document for the following DTD:
<!-- DTD for information about a family -->
<!-- (c) Sergio Lujan Mora, 2011 -->
<!ELEMENT FAMILY (PERSON*)>
<!ELEMENT PERSON (NAME, SURNAME)>
<!ELEMENT NAME (#PCDATA)>
<!ELEMENT SURNAME (#PCDATA)>
<!ATTLIST PERSON PNUMBER ID #REQUIRED>
<!ATTLIST PERSON FATHER IDREF #IMPLIED>
<!ATTLIST PERSON MOTHER IDREF #IMPLIED>

6) Write a valid XML document for the following DTD:

<!-- DTD for a book -->
<!-- (c) Sergio Lujan Mora, 2011 -->
<!ELEMENT book (front-cover, main, rear-cover?)>
<!-- PORTADA -->
<!ELEMENT front-cover (title, edition, author, editor)>
<!ELEMENT title (#PCDATA)>
<!ELEMENT edition (#PCDATA)>
<!ELEMENT author ((name, surname, email?) | anonymous)>
<!ELEMENT name (#PCDATA)>
<!ELEMENT surname (#PCDATA)>
<!ELEMENT email (#PCDATA)>
<!ELEMENT anonymous EMPTY>
<!ELEMENT editor (name, surname, address?)>
<!ELEMENT address (street, city, region?, country?)>
<!ELEMENT street (#PCDATA)>
<!ELEMENT city (#PCDATA)>
<!ELEMENT region (#PCDATA)>
<!ELEMENT country (#PCDATA)>
<!-- CUERPO -->
<!ELEMENT main ((part, part+) | chapter+)>
<!ELEMENT part (title, chapter+)>
<!ENTITY % Blocks "(paragraph | list | code)"*>
<!ELEMENT chapter (title, %Blocks;, section*)>
<!ELEMENT section (title, %Blocks;, sub-section*)>
<!ELEMENT sub-section (title, %Blocks;)>
<!ELEMENT paragraph (#PCDATA)>
<!ATTLIST paragraph align (left | center | right | justify) "just">
<!ELEMENT list (item+)>
<!ATTLIST list type (num | rom | alpha) #REQUIRED>
<!ELEMENT item (#PCDATA)>
<!ELEMENT code (#PCDATA)>
<!ATTLIST code language (c | cobol | java | vb) "c">
<!-- CONTRAPORTADA -->
<!ELEMENT rear-cover (glossary)>
<!ELEMENT glossary (title, item-gloss*)>
<!ELEMENT item-gloss (title, definition+*)>
<!ELEMENT definition (#PCDATA)>

7) Write a valid XML document for the following DTD (from http://www.davidmoisan.org/):

<!DOCTYPE TVSCHEDULE [
<!ELEMENT TVSCHEDULE (CHANNEL+)>
<!ELEMENT CHANNEL (BANNER,DAY+)>
<!ELEMENT BANNER (#PCDATA)>
<!ELEMENT DAY (DATE,(HOLIDAY|PROGRAMSLOT+)*)>
<!ELEMENT HOLIDAY (#PCDATA)>
<!ELEMENT DATE (#PCDATA)>
<!ELEMENT PROGRAMSLOT (TIME,TITLE,DESCRIPTION?)>
<!ELEMENT TIME (#PCDATA)>
<!ELEMENT TITLE (#PCDATA)>
<!ELEMENT DESCRIPTION (#PCDATA)>

<!ATTLIST TVSCHEDULE NAME CDATA #REQUIRED>
<!ATTLIST CHANNEL CHAN CDATA #REQUIRED>
<!ATTLIST PROGRAMSLOT VTR CDATA #IMPLIED>
<!ATTLIST TITLE RATING CDATA #IMPLIED>
<!ATTLIST TITLE LANGUAGE CDATA #IMPLIED>
]

8) Write a valid XML document for the following DTD (from http://www.vervet.com/):

<!DOCTYPE NEWSPAPER [
<!ELEMENT NEWSPAPER (ARTICLE+)>
<!ELEMENT ARTICLE (HEADLINE,BYLINE,LEAD,BODY,NOTES)>
<!ELEMENT HEADLINE (#PCDATA)>
<!ELEMENT BYLINE (#PCDATA)>
<!ELEMENT LEAD (#PCDATA)>
<!ELEMENT BODY (#PCDATA)>
<!ELEMENT NOTES (#PCDATA)>
<!ATTLIST ARTICLE AUTHOR CDATA #REQUIRED>
<!ATTLIST ARTICLE EDITOR CDATA #IMPLIED>
<!ATTLIST ARTICLE DATE CDATA #IMPLIED>
<!ATTLIST ARTICLE EDITION CDATA #IMPLIED>
<!ENTITY NEWSPAPER "Vervet Logic Times" >
<!ENTITY PUBLISHER "Vervet Logic Press" >
<!ENTITY COPYRIGHT "Copyright 1998 Vervet Logic Press" >
]

9) Write a valid XML document for the following DTD (from http://www.vervet.com/):

<!DOCTYPE CATALOG [
<!ENTITY AUTHOR "John Doe">
<!ENTITY COMPANY "JD Power Tools, Inc.">
<!ENTITY EMAIL "jd@jd-tools.com">

<!ELEMENT CATALOG (PRODUCT+)> 

<!ELEMENT PRODUCT  
(SPECIFICATIONS+, OPTIONS?, PRICE+, NOTES?)>
<!ATTLIST PRODUCT 
NAME CDATA #IMPLIED 
CATEGORY (HandTool|Table|Shop-Professional) "HandTool" 
PARTNUM CDATA #IMPLIED 
PLANT (Pittsburgh|Milwaukee|Chicago) "Chicago" 
INVENTORY (InStock|Backordered|Discontinued) "InStock">

<!ELEMENT SPECIFICATIONS (#PCDATA)> 
<!ATTLIST SPECIFICATIONS 
WEIGHT CDATA #IMPLIED 
POWER CDATA #IMPLIED>

<!ELEMENT OPTIONS (#PCDATA)> 
<!ATTLIST OPTIONS 
FINISH (Metal|Polished|Matte) "Matte" 
ADAPTER (Included|Optional|NotApplicable) "Included" 
CASE (HardShell|Soft|NotApplicable) "HardShell">

<!ELEMENT PRICE (#PCDATA)> 
<!ATTLIST PRICE 
MSRP CDATA #IMPLIED 
WHOLESALE CDATA #IMPLIED 
STREET CDATA #IMPLIED 
SHIPPING CDATA #IMPLIED>

<!ELEMENT NOTES (#PCDATA)> 
]>