DSV Institutionen för Data-
och Systemvetenskap

STOCKHOLMS UNIVERSITET

KUNGLIGA TEKNISKA HÖGSKOLAN

***:96 (SU) and 2I1263 (KTH)
Internet Application Protocols
and Standards**

Exam 1999-11-09

The following documents are allowed during the exam:

a) Documents in Compendium 1, printed on coloured paper.

b) Documents in Compendium 2, printed on coloured paper.

c) Documents in Compendium 3, printed on coloured paper.

d) Ordinary language dictionaries between English and Swedish.

Note 1: Compendium 4, 5 and 6 are not allowed during the exam.

Note 2: Some students may have the compendiums from the previous time this course was given. Some of these compendiums have yellow paper only on the front page of the allowed documents, and there was a separate document Appendix A: ASN.1 syntax (basic items) which is allowed during the exam.

Note 3: Compendium 4 was wrongly printed on yellow paper in August 1998, but is not allowed during the exam.

Note 4: A few copies of these compendiums (part 1-3) will be available for loan during the exam for students who have not bought the compediums.

Important warning

It is not acceptable to answer an exam question by just a verbatim quote from the allowed documents above. You must show that you understand the question and your answer by using your own words.

Questions during the exam

Jacob Palme is in USA that week. If you have urgent questions during the exam, you might try to call me at my hotel in the USA, phone number 001-202-756-5125, kl 11:00-12:00 Swedish time (It is OK to call even though it is night in the USA at that time).

Notification of result by e-mail

If you write your e-mail address on the front cover page of the exam, then you will be notified by e-mail if you did not pass the exam.

No.	Question in English	Question in Swedish	Max points
1.	Before the WWW was invented, Internet users used FTP to download documents from other sites. Today, HTTP is often used instead. What are the advantages with using HTTP instead of FTP for downloading files from public archives?	Innan WWW hade uppfunnits, brukade Internet-användare använda FTP för att ladda ner dokument från arkiv på nätet. Idag använder man ofta HTTP istället. Vad är fördelarna med att använda HTTP istället för FTP för att hämta filer från publika arkiv?	6

No.	Question in English	Question in Swedish	Max points

Suggested reply:

FTP requires a series of interactions to establish a connection, which is costly, especially if you only intend to download one or a few files. In particular, FTP for public files requires a simulated login (so-called anonymous login).

FTP uses two channels, one for commands and one for data, this also makes communication establishment more costly, and makes it complex to handle two simultaneous sessions to download different documents.

HTTP has a more versatile mode of specifying file type with the Content-Type header.

HTTP allows conditional downloads and supports proxies and caching beter than FTP.

HTTP version 1.1 has support for multiple downloads in one connection combined with pipelining.

No.	Question in English	Question in Swedish	Max points
2	Below is a specification of a proposed addition to Internet e-mail. The specification is based on ABNF. Write a specificaction which will convey the same information using ASN.1. You need only translate the syntax (down to "**Note:**") not the explanatory text which comes after "**Note:**". Note: Your solution need only transfer the information, not the syntactical form.	Nedan är en specifikation för ett förslag till tillägg till Internet e-mail. Skriv en specifikation som kan transportera samma information, men med hjälp av ASN.1. Du behöver bara översätta syntaxen (fram till "**Note:**") och inte den förklarande texten som följer därefter. Anmärkning: Din lösning behöver bara överföra informationen, inte den syntaktiska formen.	6

Supersedes

Syntax

```
    Supersedes-field            = "Supersedes:" " " identifier
                                  *(identifier)
                                  optional-parameter-list
                                  CRLF

    optional-parameter-list     = *( ";" " " parameter )

    parameter                   = parameter-name [ "="
                                  parameter-value ]

    parameter-name              = "noshow" / "show" / "repost"
                                  private-parameter /
                                  future-parameter
```

Note: There is no comma between multiple values, and that each Message-ID value is to be surrounded by angle brackets.

Warning: Some software may not work correctly with comments in header fields, especially comments in other places than at the

No.	Question in English	Question in Swedish	Max points
	beginning and end of the field value. Warning: This header MUST be spelled "Supersedes" and not "Supercedes". **Semantics** The Supersedes header identifies previous correspondence, which this message supersedes. Different messaging agents such as user agents, mailing list expanders and mailing list archives. A user agent is expected to handle this field in much the same way as the In-Reply-To and References header. **Note:** The Message-ID of a superseding message MUST be different from the Message-ID of the superseded message. The Message-ID of the superseded message is used as value in the "Supersedes:" header, not in the Message-ID of the superseding message. **Parameters:** noshow In the opinion of the sender, this message makes such a minor change to the superseded version, that a recipient, who has already seen the previous verson, will probably not want to see the new version, unless the user explicitly asks for it. show In the opinion of the sender, this message makes such a large change to the superseded version, that a recipient, who has already seen the previous version, will probably want to see the new version, too. repost This document is a document which is repeatedly, at regular or irregular intervals, reposted, such as FAQs or mailing list monthly information. None of these parameters have values. The "noshow" and the "show" parameters are mutually exclusive, but both of them can occur together with the "repost" parameter.		

No.	Question in English	Question in Swedish	Max points

	Solution 1
	
	Supersedes ::= SET OF SupersedesParameter
	
	SupersedesParameter ::= CHOICE { [0] Show, [1] Repost, [2] Private, [3] Future }
	
	Show ::= BOOLEAN
	
	Repost ::= NULL
	
	Private ::= ANY
	
	Future ::= ANY
	
	Solution 2
	
	Supersedes ::= SEQUENCE {
	    show [0] BOOLEAN OPTIONAL,
	    repost [1] NULL OPTIONAL,
	    private [2] ANY OPTIONAL,
	    future [3] ANY OPTIONAL }
	
	A more advanced alternative to **ANY** in Solutions 1 and 2 might be
	to use **EXTERNAL** or some own-defined variant of **EXTERNAL**.
	
	A common error
	
	A common error was solutions, which tried to convey the syntactical data, like ";" and " ". But the task was not to convey the syntactical form, only to convey the data. ASN.1 has its own syntactical coding conventions, produced by BER.		

3	At the web site http://www.frukt.se, people can buy apples, oranges, and bananas. A customer's basket can contain for example 0.5 kilograms apples and 1.4 kilogram bananas. What command, and with which parameters, can such a web site use to store this information in a cookie in the user's workstation?	På web-sajten http://www.frukt.se kan kunder köpa äpplen, apelsiner och bananer. En kundkorg kan t.ex. innehålla 0,5 kilo äpplen och 1,4 kilo bananer. Vilket kommando, och med vilka parametrar, kan en sådan web-sajt använda för att lagra denna information i en cookie i användarens persondator?	6

No.	Question in English	Question in Swedish	Max points
	Solution 1: ``` HTTP/1.1 200 OK Set-Cookie: basket="apples=0.5,bananas=1.4"; Version="1"; ... Form for ordering more items or ordering the selected items... ``` **Alternative solution:** ``` Set-Cookie: basket.apples="0.5";Version="1", basket.bananas="1.4"; Version="1"; ```		
4	Below is shown a small part of a web page. Specify the HTML code to generate this. Note 1: No graphics (<IMG> tags) are used. Note 2: The distance between "Go to:" and "All forums" is slightly larger than the distance between row 2 and 3. But I will give 5 points for an otherwise correct answer, even for those who cannot propose how to achieve this without user of an <IMG> tag.	Nedan visas en liten del av en webb-sida. Ange HTML-kod som visas på detta sätt. Anmärkning 1: Ingen grafik <<IMG>-etiketter) skall användas. Anmärkning 2: Avståndet mellan "Go to:" och "All forums" är något längre än avståndet mellan rad 2 och 3. Men jag ger 5 poäng även till den som inte kan komma på hur det görs utan användning av en <IMG>-etikett, om svaret i övrigt är korrekt.	6

Institutionen för Data- och Systemvetenskap

Department of Computer and Systems Sciences

No.	Question in English	Question in Swedish	Max points
	Solution 1: There are of course many ways to achieve this. Below is one solution. All this was not required for full score on the exam. The actual web page from which the example was taken used style sheets, but the solution below does not use style sheets.		

```
<table border="0" cellspacing="0" cellpadding="5">
<tr valign="top"><td bgcolor="#003333" width="150">
  <font color="#CCCC99" size="2" face="Verdana"><b>
  Go to:</b></font><br>
  <a href="foo.bar/allforums">
  <font color="#CCCC99" size="2" face="Verdana"
   style="text-decoration:none"><b>
  All forums</b></font></a>
  <font face="Verdana" size=4><b> </b></font><br>
  <a href="foo.bar/Work">
  <font color="#CCCC99" size="2" face="Verdana"
   style="text-decoration:none"><b>
    Work</b></font></a><br>
  <a href="foo.bar/bugsinkom2000">
  <font color="#FFCCCC" size="2" face="Verdana"
   style="text-decoration:none"><b>
      Bugs in KOM 2000</b></font></a>
  <br><br>
</td></tr></table>
```

A very different solutions would be to split the table into many cells to achieve the desired look.

Explanations

`<td bgcolor="#003333" width="150">` will produce a table cell, filled with a dark colour.

`<font face="Verdana" size=4><b> </b></font>` will introduce one large (non-visibile) character on the second line, causing the line difference before this line to be slightly increased.

Since this is obviously a command bar, `<a href=...` was added for the commands.

`style="text-decoriation:none"` will inhibit the normal underscoring of links made by most web browsers.

No.	Question in English	Question in Swedish	Max points
	Solution 2: This solution uses a multi-cell construct instead: (code below)		

```html
<table border="0" cellspacing="0" cellpadding="0" width="150">
  <tr>
    <td bgcolor="#003333" height=20 colspan="3" valign=middle>
    <font color="#CCCC99" size="2" face="Verdana"><b>
    Go to:</b></font></td>
  </tr>
  <tr>
    <td bgcolor="#003333" colspan="3" valign=top>
    <a href="foo.bar/allforums">
    <font color="#CCCC99" size="2" face="Verdana"
    style="text-decoration:none"><b>
     All forums</b></font></a></td>
  </tr>
  <tr>
    <td bgcolor="#003333" width="10"> </td>
    <td bgcolor="#003333" colspan="2" valign=top>
    <a href="foo.bar/Work">
    <font color="#CCCC99" size="2" face="Verdana"
     style="text-decoration:none">
    <b>Work</b></font></a></td>
  </tr>
  <tr>
    <td bgcolor="#003333"height="30"> </td>
    <td bgcolor="#003333" width="10" height="30"> </td>
    <td bgcolor="#003333" height="30" valign=top>
    <a href="foo.bar/bugsinkom2000">
    <font color="#FFCCCC" size="2" face="Verdana"
     style="text-decoration:none"><b>
    Bugs in KOM 2000</b></font></a></td>
  </tr>
</table>
```