



Institutionen för Data-
och Systemvetenskap



STOCKHOLMS
UNIVERSITET



KUNGLIGA
TEKNISKA
HÖGSKOLAN

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

Exam 2005-01-11-solved.doc

The following documents are allowed during the exam:

1. Documents in Compendium 1, printed on colored paper.
2. Documents in Compendium 2, printed on colored paper.
3. Documents in Compendium 3, printed on colored paper.
4. Documents in Compendium 7, printed on colored paper.
5. Documents in Compendium 9, printed on colored paper.
6. Ordinary language dictionaries between English and Swedish.

Note 1: Compendium 0, 4, 5, 6 and 8 are not allowed during the exam.

Note 2: The exam supervisor will check that you do not have copies of the disallowed compendiums. Bringing such compendiums on colored paper is cheating and can result in suspension of your rights to study.

Note 3: Underscoring and short handwritten notes in the yellow documents are allowed.

Note 4: A few copies of the allowed compendiums will be available for loan during the exam for students who have not brought the compendiums.

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.

Jacob Palme will come to the exam rooms about 15:00 to ask if anyone needs a clarification of a question.

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No.	Question in English	Question in Swedish	Max points
1	Write an ASN.1 specification for a protocol to communicate with a space probe. The protocol should send, to the probe, a series of commands, consisting of a text name and a numerical value. As result, the space probe should return a response for each command. The probe can also send time stamped lab test results and video recordings.	Skriv en ASN.1-specifikation för ett protokoll för att kommunicera med en rymdsond. Protokollet skall sända, till rymdsonden, en serie kommandon, som består av ett textnamn och ett numeriskt värde. Rymdsonden skall returnera ett svar för varje kommandon. Den kan också returnera tidsmarkerade laborietestresultat och videoinspelningar.	6

Answer

ToProbe ::= SEQUENCE OF ToCommand

**ToCommand ::= SEQUENCE {
 name UniversalString,
 value INTEGER }**

FromProbe ::= SEQUENCE OF FromCommand

**FromCommand ::= SEQUENCE {
 tocommand ToCommand,
 time UTCTime,
 value ReturnValue }**

**ReturnValue ::= CHOICE {
 video BITSTRING,
 labresult INTEGER }**

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|---|--|--|---|
| 2 | Describe important properties of the text mode of transferring files with FTP. | Beskriv viktiga egenskaper hos text-läget för överföring av filer med FTP. | 6 |
|---|--|--|---|

Answer:

The text is transformed to a standard format for sending, and at receipt transformed again to the local format for storage.

The standard format uses CRLF for line breaks and is encoded using the ASCII (or, today) other standard charset.



No.	Question in English	Question in Swedish	Max points
3	Which are the problems with using checksums to ensure message integrity, and how can these problems be solved. How is this handled for ASN.1 data?	Vilka är problemen med att använda checksummor för att säkerställa att meddelanden kommer fram oförändrade, och hur kan dessa problem lösas? Hur hanterar man detta för ASN.1-data?	6
Answer:			
To avoid manipulation of the checksum, it can be encrypted.			
To avoid a modified text giving the same checksum, a checksum algorithm is used which makes this very difficult.			
To avoid content being modified during transmit, invalidating the checksum, a standard transfer format is used. For example, plain text is bad, but BASE64 is good.			
In ASN.1, there are defined special encoding formats, in which all alternative ways of encoding the same information are removed, so that the same information can only be sent in one way.			
4	Is there a way of typing informational fields in XML? If so, how?	Finns det, i XML, någon metod att typkoda informationsfält? Om ja, hur?	6
Answer:			
To give a type to an XML element you can include a typing attribute in the envelope. Example: <SIZE Type="INTEGER">3</SIZE>			
XML attributes, however, have a rather limited set of built-in types, such as CDATA, IDREF, ENTITY, NMTOKEN or an enumerated number of different values.			