PRINCE OF SONGKLA UNIVERSITY FACULTY OF ENGINEERING

Final Examination: Semester 1

Academic Year: 2012-2013

Date: October 8, 2012 (2555)

Time: 13:30 – 16:30

Subject Number: 242-643

Room: Robot

Subject Title: The Internet and its Protocols

| Name: | Student Number: |
|-------------|-----------------|
| | |

Exam Duration: 3 hours

This paper has 8 pages (including this page).

- Write the answers in the spaces provided in the examination paper.
- Clearly write your student number in the space provided at the top of each page. Write your name and student number in the spaces provided on this cover page.
- There are 80 marks total for this exam.

Authorised Materials:

• Anything the student can carry (except communication devices.)

Instructions to Students:

- Attempt all 6 questions.
- Anything illegible is incorrect.
- Show all calculations, not just the final result.
 You may approximate answers, precise numerical accuracy is not required.
- Answer briefly where possible, essays are **not** required. There is no need to use all of the space provided for each answer!
- The marks allocated for each question are shown next to that question.
- Answer questions in English. Good English is **not** required.

For marker's use only.

| 1 | 2 | 3 | 4 | 5 | 6 | Total |
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| 242-643 / Intern | net and its Protocols | Student Number: | |
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| Question 1. | | (25 marks) | |
| A) | Explain the purposes an used to generate and use (CGA). | nd uses of the public and private keys when e a Cryptographically Generated Address [10 mark] | ks] |
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| B) | What is the procedure fol needs to validate the auth | lowed by a node that receives enticity of the address. | a CGA and [10 marks] |
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| C) | After a CGA has been vanow knows, and what it | alidated, explain what the validoes not know. | dating node [5 marks] |
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| Question | 2. | (10 marks) |
| | network, is assigned two add Address. | mobile node, while away from its home dresses: the <i>Home Address</i> , and a <i>Care of</i> |
| | Explain the requirements in choice. | the design of Mobile IP that led to this design |
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| Question 3. | (15 marks) |
| addresses for future Internet r | IP version 4 would not have sufficient requirements, it became clear that a new which many more addresses would be me IPv6.) |
| would take considerable time | at developing and deploying this new protocol, and it was clear that IPv4, as it was being ave sufficient addresses to remain viable until |
| | were assigned and used was changed, which to be useful, long after it would have otherwise |
| Explain what was changed, at IPv4. | nd how that has prolonged the effective life of |
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| Question 4. A) | What are the technical, a header field in IP version version 6? | (10 marks) and practical, differences between n 4, and the Hop Count header fice | the TTL eld in IP [5 marks] |
| | | | |
| D) | Why was this field char | nged as described in your answer t | to the |
| B) | previous part of the que | stion? | [5 marks] |
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| Question | ı 5. | (10 marks) |
| | A new protocol is to be designed, allowing for new options to be cre | containing some number of options, and eated in the future. |
| | | pose to use a single octet (byte) to number assumed to ever need to be defined). |
| | and from 128 to 254 for user (or v | nbers from 1 to 127 for "standard" options, vendor) created (private) options. (Option (ned to provide a method of extending the required.) |
| | Give the reasons you would use to design. | o support, or to oppose, this proposed |
| | You should ignore all issues other is, assume that the rest of the prot | than the question of option numbers – that cocol design is perfect |
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| 242-643 | 3 / Intern | et and its Protocols | Student Number: | |
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| Questi | on 6. A) | Explain why IP fragn | (10 marks) nentation should be avoided wherever | possible. [4 marks] |
| - - | | | | |
| | B) | How do nodes avoid | l use of IP fragmentation? | [3 marks] |
| - - - | | | | |
| C | | Despite the reasons sometimes required cannot be avoided. | s for avoiding use of IP fragmentation d. Explain the circumstances when fr | , it is still agmentation [3 marks] |
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