Mittuniversitetet
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# Försättsblad Prov Original

| Kurskod | Provkod | Tentamensdatum |
|---|---|---|
| DT154G | Q204 | 2019-03-22 |
| Kursnamn | Datateknik GR (B), Nätverksteknik B | |
| Provnamn | Tentamen - Sundsvall | |
| Ort | Sundsvall | |
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Final Exam

# DT154G Network Technology B

Magnus Eriksson
magnus.eriksson@miun.se
*Phone:* 010 142 8740

Lennart Franked
lennart.franked@miun.se
*Phone:* 010 142 8683

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## Instructions

Carefully read the questions before you start answering them. Note the time limit of the exam and plan your answers accordingly. Only answer the question. The questions are *not* sorted by difficulty. Clearly show which answer you are giving your solution to. *Always motivate your answers and show your calculations.*

**Time** 5 hours.

**Exam Aids** Dictionary, pen and paper.

**Maximum points** 30

**Questions** 10

### Preliminary grades

The following grading criteria applies: E $\geq$ 30%, D $\geq$ 45%, C $\geq$ 60%, B $\geq$ 75%, A $\geq$ 90%. Scoring will be based on level of depth shown in your answer. To pass this exam you must have shown proficient knowledge in all the intended learning outcomes (ILO) covered in this exam. Each questions ILO affiliation is shown as (ILO: #). The grade limit given is preliminary per ILO. Final grade is set based on your performance on each individual ILO.

## Covered ILO

This exam covers the following Intended Learning Outcomes (ILO)

- ILO: 1 – Discuss and apply common protocols and technologies used for achieving network redundancy
- ILO: 2 – List and explain the difference wireless network standards.
- ILO: 3 – Explain how routing protocols behave in different types of network topologies.
- ILO: 4 – List and explain common WAN protocols and technologies.

## Questions

The questions below are not given in any particular order.

(3p) 1. *(ILO: 1)* Give some examples and discuss what you need to think about when connecting multiple switches running several VLAN, with VTP enabled.

(3p) 2. *(ILO: 1)* Discuss the need for FHRP and how it works. Can this be achieved in some other way? Why?

(3p) 3. *(ILO: 1)* Why is Rapid-STP so much quicker than legacy stp?

(3p) 4. *(ILO: 2)* Name and explain at least three different wireless network technologies that are being used for WAN-connections.

(3p) 5. *(ILO: 3)* EIGRP supports metric values based on bandwidth, delay, load and reliability. Discuss when it is suitable to use which metric values to find the best path. That is, for each type of metric value, explain when this should be considered to find the best path.

(3p) 6. *(ILO: 3)* In a multiaccess network where we have six OSPF routers connected to the same area. If we weren't using DR and BDR, how many adjacencies would be formed? Show your calculation! If we are using DR and BDR, how many adjacencies would be formed?

(3p) 7. *(ILO: 3)* Based on how an OSPF Multiarea network is built, explain at least three LSA types and why they are needed, when having a network composed of two different areas and one router connected to another AS.

(3p) 8. *(ILO: 4)* What is the aim of, similarities and difference between

- Carrier Wave Modulation
- Frequency Division Multiplexing (FDM)
- Frequency Division Multiple Access (FDMA)

(3p) 9. *(ILO: 4)* For each of the following statements, indicate if it mostly is true or false for (i) Circuit mode switching, (ii) virtual circuit switching, (iii) datagram networks: (A statement may be true for one or several of these three switching modes)

(a) For example x.25, Frame relay, ATM, MPLS and GPRS

(b) Conventional IP routing

(c) Today's digital public telephone network, ISDN and SONET/SDH

(d) Before transferring useful data over a network, the source node must establish a path consisting of links that the data will traverse between source and destination.

(e) May use statistical multiplexing and packet mode switching

(f) May use for example time division multiplexing (TDM) or frequency division multiplexing (FDM)

(g) Data may be delivered out of order, since tha path may change during a communication session.

(h) Constant bit rate and fix number of channel.

(3p) 10. *(ILO: 4)* With the help of the 4-layer TCP/IP suite, draw a figure that shows the encapsulation process of a http-stream that is being sent from a client to a server, and back, over a GRE-tunnel. Assume that the local network is within 192.168.0.0/28 and the tunnel is over the IPv6 network 2001:207::/126