

S-72.1130 Telecommunication Systems

Closed-book Exam 7.1.2009

1. Indicate whether the following statements are TRUE or FALSE (for each statement, correct answer yields 2p, wrong answer yields -1 p, no answer: 0 p):

- a) Address resolution protocol (ARP) takes care of determining data link addresses
- b) UDP is a connection oriented transport layer protocol
- c) Collision detection (CD) strives to avoid hidden terminal problem
- d) Frame relay applies virtual circuits
- e) V.90 is a modem standard
- f) Network interface device (NID) resides in DSL forum reference model before network terminal (NT) in customers premises (CP) (looking from WAN or local loop cable side)
- g) Manchester encoding is used in 10BaseT
- h) Extended service set (ESS) is applied in 802.11 infrastructure-mode
- i) Traffic concentration is applied in order to avoid blocking
- j) In Ethernet's CSMA/CD exponential back-off is applied in order to adapt retransmission attempts to estimated current load

2. Please answer the following questions using not more than 80 words per topic (subsequent words will be disregarded) and/or by a figure: (5 p each) Note: Numbers in parenthesis refer to the required number of items for each question if not otherwise indicated.

- a) Describe benefits (2) and drawbacks (2) of layered telecommunication network reference modelling approach (as the OSI-model)
- b) Describe the function, realization and application of point coordination function (PCF)
- c) Describe client-server architecture eg. list functions of server (3) and client (3)
- d) Describe some P2P architecture features (4) and give two application examples
- e) Describe following xDSL features: Example of achievable rates, applied frequency range in transmission, transmission path requirements, traffic symmetry, especially supported traffic types
- f) How xDSL technology fights against interference and cross-talk (3)?
- g) List start-up phases of Rate Adaptive ADSL (RADSL) (5)
- h) Describe types and division of dynamic medium access control medium sharing techniques and give respective example in each subcategory (5)
- i) Describe in Code Division Multiplexing: Types (2), a figure of merit (1), benefits (2), and application examples (2)
- j) In which layer does HDLC Protocol work? Name its major functionalities (4)