ECSE-6600: Internet Protocols
Exam 2

Time: 75 min (strictly enforced)

[Hint: spend time roughly in proportion to the points allocated to questions]

Points: 40

YOUR NAME:

Be brief, but **DO NOT** omit necessary detail

{Note: Simply copying text directly from the slides or notes will not earn (partial) credit. Brief, clear and consistent explanation will.}

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[10 pts] 1. Intra-Domain Routing Protocols: Explain the similarities/differences between OSPF and PNNI (5 pts). How does MPLS facilitate traffic engineering beyond what OSPF or PNNI provide (5 pts)? [Reminder: be brief! You have to answer many questions in limited time.]
[10 pts] 2. Inter-Domain Routing Protocols: Explain why path-vector & attribute-based vectoring is preferred to link-state routing in Inter-domain routing (4 pts)? What mechanisms are used in BGP (and how are they used) to facilitate in-bound and out-bound traffic engineering for an AS (6 pts).
[10 pts] 3. Congestion Control: Explain how methods like AQM schemes (eg: RED), multi-bit feedback (eg: ERICA, VCP) and FEC integration (LT-TCP) improve performance of transport protocols (6 pts)? What is the concept of TCP friendliness (2 pts)? How do the binomial schemes allow a family of schemes to be TCP friendly (2 pts)?
[10 pts] 4. Multicast: Why is the multicast transport reliability problem very different from unicast reliability (3 pts)? How are mechanisms like subcast, FEC, feedback aggregation useful (2 pts)? Explain the drop-to-zero and TCP-friendliness problems in single-rate multicast congestion control (3 pts). How does RLM achieve multi-rate multicast congestion control (2 pts)?
[10 pts] 5. IPv6: How does IPv6 use its abundance of address space to simplify/consolidate auto-configuration, renumbering, address allocation, neighbor discovery etc (6 pts)? How does the dual-stack and 6-to-4 automatic tunneling approaches help deal with the transition issues (4 pts)?