Not exhaustive - read the slides, homework, and chapter 1-3

Mathematical questions would be similar to homeworks.

No coding questions, not even pseudo code. Focus on understanding the concepts – why things work the way they do? What happens if we change things.

Expect questions similar to the homeworks but more well defined – you won't have to look anything up.

Combination of (a) explain things (b) calculate things (c) multiple choice (d) fill in the blanks (e) what if (e) why (f) compare between.

Basics:

- Network as a graph abstraction
- Network layers, what they do and why are they important?
- Circuit switching → TDM and FDM
- Packet switching → Statistical multiplexing
- Bandwidth delay – why does it matter?
- Network performance, what affects it?
- How are packets represented in bits?
- How do you encode packets in electrical signals?
- Frames and point to point links
- Error detection fundamentals – how to detect bit errors – parity
- Error correction – why do we need it?
- Error correction algorithms – Stop and wait , what are the problems? Calculate stop and wait delay
- Sliding window protocol – calculate sliding window
- Go back and n and selective repeat – what's the problems with them?
- Shared medium – ethernet
- Random access, CSMA/CD, CSMA/CA – what do they do and where are they used?
- How they manage collision?
- Ethernet Transmitter Algorithm
- Why ethernet length is limited?
- Difference between ethernet and wireless
- What are the characteristics of wireless lan? How does it avoid collisions?
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- Switching! Why is is needed?
- What is a switching table and how do you populate one? Calculate one from a given topology.
- How do switches self learn?
- Spanning tree, calculate one.
- LANs vs VLANs Why VLANs?
- Frames vs packets!!!!
- Why do we need IP? IP addessing, calculate IP addresses, subnets. Given an address space, how would you allocate addresses to subnets? How would you break down a larger subnet (/16) into smaller ones (/24s)? How many of those smaller subnets can you have?
- How does DHCP and ARP work? How do they contribute to creating networks?
  IP service model, fragmentation and reassembly

- IP service model, fragmentation and reassembly
- NAT – why do we need it, NAT table, show such a table
- ICMP – are they part of IP? What purpose does it serve? What makes traceroute work?
- Routing vs switching, Dijkstra's, Link state, Bellman ford, Distance vector, calculate a table, count to infinity problem. Given a figure, calculate a distance vector table.