

# CS 307 Computer Networks

Take Home Exam (Section BCS – 6G), 1<sup>th</sup> June, 2021

Max. Weightage: 8 Marks.

Allowed Time: 12 hours (from release of exam).

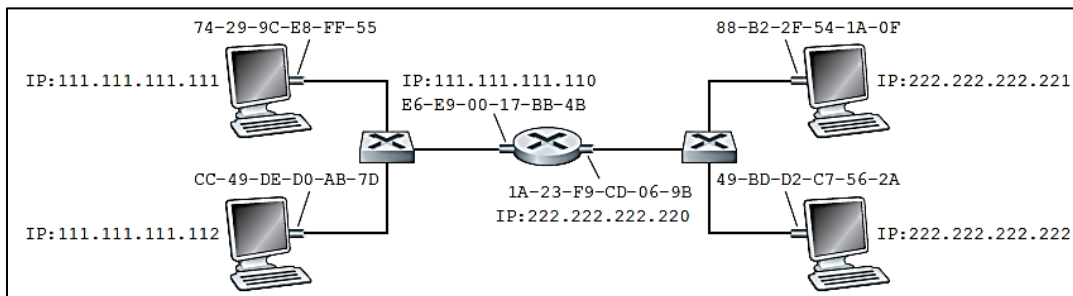
## Instructions:

1. Write your name, roll number on every page
2. This exam is off-line and the examination center is your room in your parent/guardian's house.
3. Understanding the scenario and all questions is also part of the exam.
4. You are supposed to attempt this exam alone, in your room located in your parent/guardian's house. No marks will be allocated if this understanding is violated even after submitting the exam and the case will be reported to the department.
5. Precisely answer what is being asked in the question. Unrelated part of answers shall not be graded.
6. Do not consult any material in any form using any medium while doing this exam.
7. Attempt this exam on loose sheet of paper, in compact form, and upload the exam.
8. Submission are accepted in the form of a single PDF file, created by the mobile app mentioned in point # 10 below. All other submission will not be graded.
9. Please ensure that you have submitted your correct file before submission. Wrong file submission risk will be on the students.
10. You must take snaps from CamScanner or similar mobile app install on your smart phone. All pages should be snapped in upright way i.e. portrait mode. There should not be any screen shots in the PDF file which the grader needs to rotate to see or read them clearly.
11. While you are attempting this exam, you must not contact anybody inside your house and outside (using any means possible including cellular or landline) for any reason related or unrelated to this exam.
12. **All unfair means will be reported to the disciplinary committee and all involved will get ZERO out of eight weightage.**

Note: Understanding the question is part of the Exam. Your submission should show that you have put in 12 hours' worth of effort to attempt the paper.

Q1. Explain the following scenarios. Marks will be assigned based on precise step wise technical information.

- i) How ARP is used in the following diagram?
- ii) When and how RARP is used?



Q2. Suppose a stable network path consisting of 3 routers between a source and destination hosts.

Now explain how IP packets are generated and received at the host running the traceroute/tracert to implement the functionality and outputs of traceroute (tracert) application. Your answer should identify the key IP header fields and different actors generating IP packets.

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- Q3. How switched Ethernet is collision free while sending and receiving at the same time? Explain. Your answer should explain the working two hosts connected to switched Ethernet switch and sending and receiving packets at the same time. Assume any suitable speed for your Ethernet switch.
- Q4. Write a short feasibility (in your own words and max up to two paragraphs) for your Boss to build the case for using VLANs in your enterprise L2 network. Also, explain the L2 architecture to accommodate 30+ VLANs in an organization as big as FAST-NU (KHI Campus).
- Q5. Explain the importance of buffer management inside router's output interface on sender TCP window size. Your answer should contains a figure similar to Figure 3.52 on page 270 of textbook PDF.
- Q6. What is the difference between conventional destinations based forwarding and SDN forwarding using flow tables? Also, list key benefits of SDN forwarding by giving a particle example of a digital telephone and computer connected to a SDN OpenFlow switch.
- Q7. Explain the term Autonomous System. Why we need Intra-AS and Inter-AS routing in Internet. Your answer should give a suitable labeled diagram to explain both types and list key benefits.
- Q8. Write comprehensive notes on the following:
- i) Concept of Areas in OSPF including Area 0.
  - ii) Why BGP advertise IP prefixes? And how BGP select optimal path when it received multiple paths for the same IP prefix.

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