



**RAJARATA UNIVERSITY OF SRI LANKA**  
**FACULTY OF APPLIED SCIENCES**

**B.Sc. (Honors) Degree in Information Technology**  
**Fourth Year - Semester I Examination – January / February 2021**

**ICT4303 – ADVANCED COMPUTER NETWORKS**

**Time: Three (03) hours**

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- There are six (06) questions in two (02) pages.
  - All questions carry equal marks.
  - Answer **ANY FIVE (05)** questions.
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1. a) Discuss why medium access control (MAC) addresses cannot be used to address devices globally. (05 marks)
  - b) Explain hierarchical routing and how classless interdomain routing (CIDR) supports hierarchical routing. (10 marks)
  - c) What precautions are necessary when using network address translation (NAT) in a network where there are publicly accessible servers? (05 marks)
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2. a) Explain why switching is required in wide area networks (WAN) while not required in local area networks (LAN). (10 marks)
  - b) Distinguish between connection-oriented and connectionless transport services. (05 marks)
  - c) Discuss the advantages of virtual circuit switching over circuit switching. (05 Marks)

3. a) Discuss why it is preferred to have distributed routing decisions than centralized routing decisions. (10 marks)
- b) What information is required for making a routing decision? (05 marks)
- c) Briefly explain the advantages of flooding as a routing technique. (05 marks)
4. a) Discuss how broadcast routing can be used in an IP network, which generally uses hierarchical routing. (05 marks)
- b) What is reverse path forwarding? Explain the requirements to have reverse path forwarding. (05 marks)
- c) Elaborate the process of sending a data packet to a mobile device which is away from its home location using Mobile IP system. (10 marks)
5. a) Discuss how tunneling works and the requirements to establish a tunnel. (05 marks)
- b) How can Point-to-Point Tunneling Protocol (PPTP) be used to interconnect two local area networks that use private IP addresses over the Internet? (05 marks)
- c) Explain the advantages of the ability to use different Network Control Protocols in Point-to-Point Protocol (PPP) links. (05 marks)
- d) Discuss why Challenge Handshake Authentication Protocol (CHAP) is more secure than Password Authentication Protocol (PAP). (05 marks)
6. a) Discuss the congestion control mechanisms of Frame Relay service. (05 marks)
- b) Briefly elaborate the importance of each of five conceptual areas of OSI Network Management Model. (10 marks)
- c) Discuss how Software Defined Networks (SDN) overcome the problem of the loss of SDN Controller. (05 marks)

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