RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (Four-Year) Degree in Information and Communication Technology
Fourth Year - Semester I Examination – September / October 2019

ICT4303 – ADVANCED COMPUTER NETWORKS

Time: Three (03) hours

- Each question caries equal marks.
- **Answer any FIVE (05) questions.**

1.

   a) Explain the difference between classful addressing and classless addressing in IPv4 networks. **(05 marks)**

   b) Discuss the advantages and disadvantages of configuring a local area network using IPv4 address ranges defined in RFC 1918. **(05 marks)**

   c) What is Network Address Translation (NAT)? Why is NAT used? **(05 marks)**

   d) Discuss how Dynamic Host Configuration Protocol (DHCP) can be used to overcome the problem of IP address exhaustion. **(05 marks)**

2.

   a) Discuss the need for switching in the subnet (Wide Area Network interconnecting Local Area Networks). **(10 marks)**

b) Explain why packet switching is more robust against hardware failures than circuit switching. **(05 marks)**

c) Explain how Multiprotocol Label Switching (MPLS) works. **(05 marks)**

3.

a) Discuss why dynamic routing is preferred over static routing in Wide Area Networks. **(05 marks)**

b) Explain the optimality principle and how it can be adopted to a routing algorithm. **(10 marks)**

c) What are the uses and drawbacks of broadcast routing? **(05 marks)**

4.

a) Explain the challenges of routing in an ad-hoc network. **(05 marks)**

b) Elaborate the purpose of "home agent" and "foreign agent" in the mobile IP system. **(05 marks)**

c) Discuss how virtual private networks help hide the identity of a user. **(05 marks)**

d) How does Point-to-Point Protocol (PPP) work? **(05 marks)**

5.

a) Elaborate the congestion control function of frame relay service. **(05 marks)**

b) What is the Management Information Base (MIB) of a network node used for? **(05 marks)**

c) Why are the single mode fibres preferred over multimode fibres in long-haul communication? **(10 marks)**

6.

a) What are the building blocks of a Software Defined Network? **(05 marks)**

b) Elaborate the function of OpenFlow in software defined networks? **(10 marks)**

c) Briefly describe the three (03) message types defined in OpenFlow protocol. **(05 Marks)**

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