UNIVERSITY OF BOLTON

CREATIVE TECHNOLOGIES

BSC COMPUTER NETWORKS & SECURITY

SEMESTER ONE EXAMINATION 2018/2019

NETWORK DESIGN AND INTEGRATION

MODULE NO: CPU6010

Date: Wednesday 16th January 2019   **Time: 14:00 - 16:00**

INSTRUCTIONS TO CANDIDATES: There are **FIVE** questions.

Answer **FOUR** questions.

All questions carry equal marks.

Individual marks are shown within the question.

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Network Design and Integration
Module No. CPU6010

QUESTION 1

a)   Indicate in which layers of the OSI model do WANs operate and describe two WAN services offered in each of those layers (2 services per layer)?

(4 marks)

b)   Traffic can be characterized by four elements (1) latency, (2) jitter, (3) loss and, (4) bandwidth. Briefly describe each of those elements?   **(6 marks)**

c)   Name and briefly describe two QoS implementations in a network.

(5 marks)

d)   Suppose you are asked to setup DiffServ classes for a cable ISP. The ISP network which only used IPv4 must handle broadcast television channels, voice (VoIP), residential Internet Services and ICMP.

How do you assign DiffServ classes and other QoS configurations and why?

(10 marks)

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QUESTION 2

a)   Using the hierarchical network design model. Compare and contrast the core, access and distribution layers ensuring that you explain the purpose of each. What is meant by the terms network area, intermediate system, and autonomous system? Describe the three services should be configured in the Distribution layer and other three services used with the core layer with short notes about the configurations.   **(20 marks)**

b)   Explain how a network connection is established between a user and a server over the Internet using the TCP protocol.   **(5 marks)**

QUESTION 3

a)   Over the past 5 years, the number or MPLS networks has increased dramatically and although no one knows exactly how many MPLS networks there are, it is generally accepted that most large UK companies have adopted MPLS to some degree. Critically assess the forwarding component of MPLS in a manner justifies its popularity. What does MPLS stand for an by
What other names is it commonly known?   **(20 marks)**

b)   Why is it often said that MPLS operates at layer 2½ of the OSI seven layer model?   **(5 marks)**

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QUESTION 4

a)   Corporation A and B use BGP to exchange routing information, Give your justification of using BGP? **(10 marks)**

b)   Critically evaluate the use of Vpnv4 with BGP along with OSPF routing protocol, concentrate on the creating and using VRFs, justify the use of the loopback interface on each router, support your analysis with relevant commands.
(15 marks)

QUESTION 5

a)   Compare the relative advantages of SNA and IP.   **(5 marks)**

b)   In your network core layer, you need to establish VPN with IPsec tunnel, describe the IKE, security associations, ISAKMP with symmetric and asymmetric cryptography algorithms, give brief details of the five steps implementations of the VPN with IPsec. **(20 marks)**

END OF QUESTIONS