# Start of Assessment

DISCLAIMER: this assessment paper has been prepared to provide a sample of the style and content of questions students may find in the Final Written Assessment. Please note that this is an **abbreviated** paper, containing only one or two questions from each of the 8 main question categories, hence being only out of 26.5 marks.

The actual Final Written Assessment paper will contain more questions, and will typically be marked out of:

- **TNE10006** – 90 to 100 marks
- **TNE60006** – 100 to 110 marks

**Q1** Consider the 802.3 Ethernet Protocol.

**a)** Do collisions occur in a switched network? Why/Why Not?

(3 marks)

**(3 marks)**

**Q2** Consider the IP Protocol

**a)** Answer each of the following questions **TRUE** or **FALSE**:

**i.** _____ `57.69.168.31/27` is a valid host IP address (1 mark)

**ii.** _____ `205.64.87.17` is in the `205.64.87.0/26` subnet (1 mark)

**b)** An IP Packet of size 5,730 bytes is sent over a link with a 600 byte MTU

**i.** How many IP fragments are sent?

_____

(1 mark)

**ii.** Fragment 3 is lost, will the IP layer request a retransmission?

_____

(1 mark)

**c)** Write the following IPv6 addresses in abbreviated form:

**i.** 48a4:00b4:0000:0000:0000:0000:cd00:0a7b

_____

(1 mark)

**d)** Consider the host with the IPv6 Address 2001:16d4:b:4:13a1:18ee:ed2b:8f7b/64

**i.** What is the Site Address Space ID with prefix?

_____

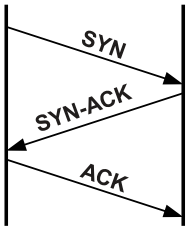
(1 mark)

**(6 marks)**

**Q3** Question 3 is a VLSM question worth 15 marks. You should understand the type of question without a sample

**Q4** This question concerns Transport Layer Protocols

**a)** Consider the TCP Three-Way Handshake depicted in the figure below, the sequence number of the first **SYN** packet is `1,543`




**i.** How many bytes of data are contained within the first SYN Packet?

_____

(1 mark)

**ii.** In the **SYN-ACK** response, what is the Acknowledgement number?

_____

(1 mark)

**iii.** What is the sequence number in the **SYN-ACK** response?

_____

(2 marks)

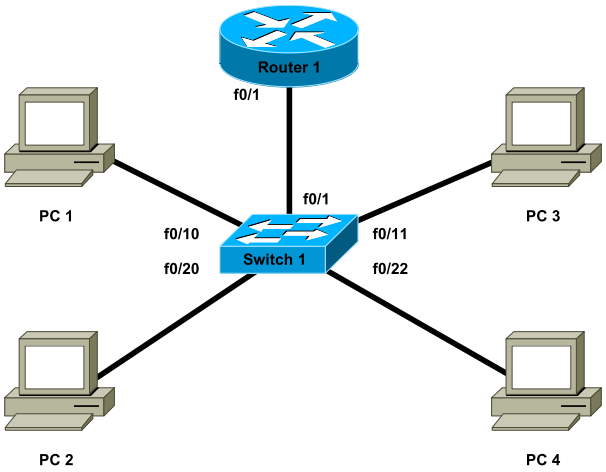
**iv.** How many bytes of data may the sender include in the final **ACK** packet?

_____

(1 mark)

**(5 marks)**

**Q5** Consider the following network with assiciated IP Address, MAC Address and ARP/MAC table information




**PC ARP Tables**

**PC 1**

| IP | MAC |
|---|---|
| 192.168.10.1 | aa:bb:cc:dd:ee:99 |

**PC 2**

| IP | MAC |
|---|---|
| Empty | |

**PC 3**

| IP | MAC |
|---|---|
| Empty | |

**PC 4**

| IP | MAC |
|---|---|
| Empty | |

**Router 1**

| IP | MAC |
|---|---|
| 192.168.10.6 | aa:bb:cc:dd:ff:01 |

**Interface Configuration Details**

| Device | Interface | VLAN | MAC | IP |
|---|---|---|---|---|
| **Router 1** | f0/1.10 | 10 | aa:bb:cc:dd:ee:99 | 192.168.10.1 |
| | f0/1.20 | 20 | aa:bb:cc:dd:ee:99 | 192.168.20.1 |
| | f0/1.99 | 99 | aa:bb:cc:dd:ee:99 | 192.168.99.1 |
| **Switch 1** | f0/1 | Trunk | – | – |
| | f0/10 | 10 | – | – |
| | f0/11 | 10 | – | – |
| | f0/20 | 20 | – | – |
| | f0/22 | 20 | – | – |
| | vlan99 | 99 | aa:bb:cc:dd:00:99 | 192.168.99.5 |
| **PC 1** | – | – | aa:bb:cc:dd:ff:01 | 192.168.10.6 |
| **PC 2** | – | – | aa:bb:cc:dd:ff:02 | 192.168.20.7 |
| **PC 3** | – | – | aa:bb:cc:dd:ff:03 | 192.168.10.8 |
| **PC 4** | – | – | aa:bb:cc:dd:ff:04 | 192.168.20.9 |

**Switch 1 MAC Table**

| MAC | Port |
|---|---|
| aa:bb:cc:dd:ee:99 | f0/1 |
| aa:bb:cc:dd:ff:01 | f0/10 |

**a)** When a packet from PC1 to PC4 traverses the trunk link from **Switch 1** to **Router 1**, fill in the following information as seen in the packet headers

| | Source | Destination |
|---|---|---|
| **MAC** | | |
| **IP** | | |

(2 marks)

**b)** Nominate one advantage and one disadvantage of a layered network protocol architecture?

- Advantage: _____
- Disadvantage: _____

(2 marks)

**(4 marks)**

**Q6** This question relates to the Spanning Tree Protocol

**a)** How is it possible to configure Cisco Switches such that a different switch becomes the root bridge for each VLAN?

(2 marks)

**(2 marks)**

**Q7** This question refers to aspects of the design of Switched networks

**a)** At which layer(s) in a Heirarchical network (*Core, Distribution or Access*) are the following switch features most important (*you may tick more than one layer*)

| **Switch Feature** | **Core** | **Distribution** | **Access** |
|---|---|---|---|
| Power over Ethernet | | | |

(½ mark)

**b)** Describe briefly what the term **Converged Network** means?

_____

_____

(1 mark)

**(1½ marks)**

**Q8** This question is about Ethernet Switching and VLANs

**a)** Nominate one advantage and one disadvantage to using trunking instead of Access Ports when connecting a Switch to another Switch or Router?

**i. Advantage**

_____

(1 mark)

**ii. Disadvantage**

_____

(1 mark)

**b)** Briefly explain how each of the following benefits are realised through the use of VLANs

**i. Cost Reduction**

_____

_____

_____

_____

(2 marks)

**(4 marks)**

**Q9** Consider a wireless network

**a)** What purpose does the SSID serve in a Wireless network?

_____

(1 mark)

**(1 marks)**

# End of Assessment

**Student Marks – Staff Use Only**

| Question: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Points: | 3 | 6 | 0 | 5 | 4 | 2 | 1½ | 4 | 1 | 26½ |
| Score: | | | | | | | | | | |