Sample Written Assessment

Networks and Switching (Swinburne University of Technology)

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?

No, as the switch has a procedure called store and forward (data sent from sender device will be stored in the switch should the recipient device is busy and will forward the data from sender once the recipient is free), hence it will effectively create a separate collision domain for each of the device

(3 marks)

(3 marks)

Q2 Consider the IP Protocol

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

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

ii. TRUE `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?

10

(1 mark)

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

No, Layer 3 is responsible for foreign device communication not restransmission, it is the job of Layer 4

(1 mark)

c) Write the following IPv6 addresses in abbreviated form:

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

48a4:b4:::::cd00:a7b

(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?

2001:16d4:000b::/48

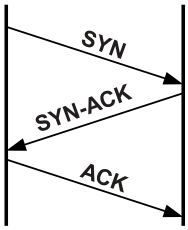
(1 mark)

(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?

TCP Data: 20 -> 60, and Application data is 0

(1 mark)

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

1,544

(1 mark)

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

We cannot know the sequence number as it is selected randomly

(2 marks)

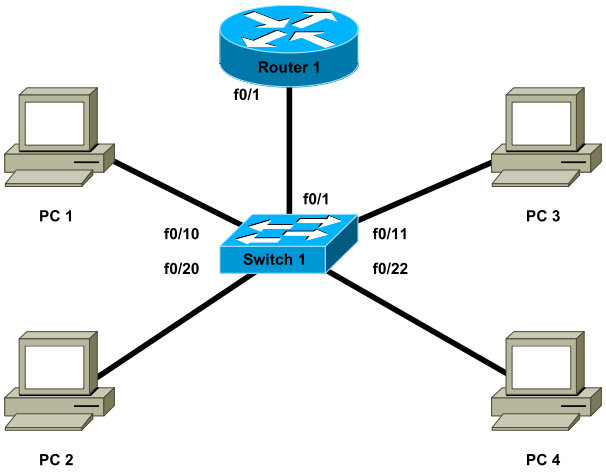
iv. How many bytes of data may the sender include in the final **ACK** packet?

No data

(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	PC1 MAC	Default gateway MAC
IP	PC1 IP	PC4 IP

(2 marks)

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

- Advantage: Common standard language
- Disadvantage: Inflexibility Complexity

(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?

In order for a different switch to be the root bridge, the priority of this switch must be increase (or decrease the priority of the other switch). As the Switch with the lowest priority will become the root

(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			X

(½ mark)

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

Carries both voice and data traffic over a single network infrastructure

(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

Flexibility

(1 mark)

ii. Disadvantage

Complex configuration Security Risk

(1 mark)

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

i. Cost Reduction

Does not need to use too much wire, interface, which reduce overhead. And also reduce the maintenance fee of these thing

(2 marks)

(4 marks)

Q9 Consider a wireless network

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

Provide a Human-readable name for the service set

Identidfy access point to 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:										