

8/1/2019

09.30 - 11.30am

National Stadium, Irish Athletic  
Boxing Centre



DUBLIN INSTITUTE OF TECHNOLOGY

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## DT211C BSc. (Honours) Degree in Computer Science (Infrastructure)

Year 2

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WINTER EXAMINATIONS 2018/19

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NETWORKING 2 [CMPU 2014]

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TUESDAY 8<sup>TH</sup> JANUARY

9.30 A.M. – 11.30 A.M.

DURATION  
TWO HOURS

INSTRUCTIONS TO CANDIDATES

ANSWER *QUESTION ONE* & TWO OTHER QUESTIONS.

QUESTION ONE IS COMPULSORY & CARRIES 50 MARKS.

ALL OTHER QUESTIONS CARRY 25 MARKS.

**Question One**

*This question is compulsory and all sections carry equal marks (5 marks).*

- a) At which layer of the OSI model is a *Router* positioned and what is the data envelope for this layer?
- b) At which layer of the OSI model is a *Switch* positioned and what is the data envelope for this layer?
- c) Identify the two primary functions of a Switch?
- d) Identify the two primary functions of a Router?
- e) What does the term *convergence* describe in both a switched network and in routers?
- f) What are the three primary advantages of using a static route in a network?
- g) A network administrator configures the router with the following command. Write down how the route will appear in the routing table and list any issues that may arise from the use of the command:

```
ip static route 209.16.1.0 255.255.255.0 172.16.2.0
```

h)

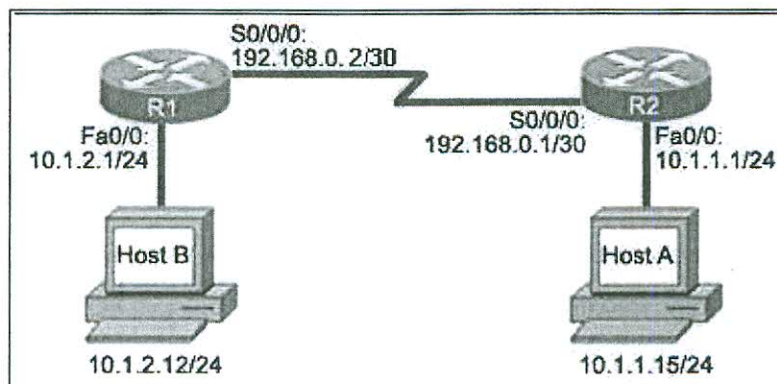


Figure 1h

Host A: 10.1.1.15/24

Host B: 10.1.2.12/24

R2:

R1:

Fa0/0 10.1.1.1/24

Fa0/0 10.1.2.1/24

S0/0/0 192.168.0.1/30

S0/0/0 192.168.0.2/30

With reference to figure 1h. Identify the default gateway for the host A.

- i) Expand the following acronyms:  
NAT  
DHCP  
CDP
- j) With reference to a Routing Table what route types do the following monikers correspond: S and C.

### Question Two

- a) Give an example of a *link state* dynamic routing protocol and a *distance vector routing* protocol.

(5 marks)

	192.168.1.0/24 is variably subnetted , 2 subnets, 2 masks
C	192.168.1.0/24 is directly connected, GigabitEthernet0/0
L	192.168.1.1/24 is directly connected, GigabitEthernet0/0
	192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C	192.168.2.0/24 is directly connected, serial
	0/0/0
L	192.168.2.1/24 is directly connected, serial0/0/0
R	192.168.3.0/24 [120/1]via 192.168.2.2, 00:00:24, serial0/0/0
R	192.168.4.0/24 [120/1]via 192.168.2.2, 00:00:24, serial0/0/0
R	192.168.5.0/24 [120/1]via 192.168.2.2, 00:00:24, serial0/0/0

Figure 1

- b) With reference to figure 1. Which protocol is in effect on the network? Explain your answer with reference to two identifying protocol variables evident within the given routing table (see figure 1).

(10 marks)

- c) With reference to figure 1. Is there any evidence of ultimate routes? Explain your answer with reference to the identifying characteristics of ultimate routes and indicate all ultimate routes evident within the given routing table (see figure 1).

(5 marks)

- d) With reference to figure 1. Is there any evidence of parent routes? Explain your answer with reference to the identifying characteristics of a parent route and indicate all parent routes evident any evident within the given routing table (see figure 1).

(5 marks)

(Total 25 marks)

**Question Three**

*By Monday, Jan. 2nd, 2019, the first three ports of all configurable switches located in all offices must be secured with MAC addresses — one address will be reserved for the PC, one address will be reserved for the laptop in the office, and one address will be reserved for the office server.*

*If a port's security is breached, we ask you to shut it down until the reason for the breach can be determined.*

- a) Detail the importance of securing a switch and explain why one port on a switch would be secured using the policy described at the start of the question.
- (10 marks)

- b) Detail the configuration of a switch port to secure access to one device with a MAC address of NETEXAM2018 using the policy described at the start of the question.

(15 marks)  
(Total 25 marks)

**Question 4**

- a) Describe briefly three of the benefits of using Virtual Local Area Networks
- (10 marks)

- b) As an Ethernet frame travels through a switch VLAN, information is added. Discuss briefly the general format of this information, identifying the standard used and indicate clearly the point at which the information is added.
- (10 marks)

- c) A Cisco switch allows traffic tagged with VLANs 10 and 20 across trunk port fa0/5; what is the effect of issuing the following command on fa0/5:  
Switch port trunk allowed vlan 30

(5 marks)  
(Total 25 marks)