AACS2034 Fundamentals of Computer Networks

Tutorial 6: Network Layer

Q1.   Examine the **FOUR (4)** basic process involved in the Network Layer to accomplish end-to-end communication. *(201603 TAR UC, resit)*   (8 marks)

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Q2.   Differentiate between encapsulation process and de-encapsulation process used in the network layer. *(201703 TAR UC, resit)*   (4 marks)

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Q3.   List and briefly describe **THREE (3)** characteristics of Internet Protocol Version 4 (IPv4).
       (201705 TAR UC, resit)   (6 marks)

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updated by Ts. Carolyn Ting Hie Choon on 2.10.2019

Tutorial 6: Network Layer

Q4.   Internet Protocol version 4 (IPv4) is the most widely used version of Internet Protocol.

   (i)   Briefly explain **TWO (2)** limitations of Internet Protocol version 4 (IPv4).
           (201509 TAR UC, Main)   (4 marks)

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   (ii)   IPv6 overcomes the limitations of IPv4. List **TWO (2)** improvements that IPv6
           provides.   (2 marks)

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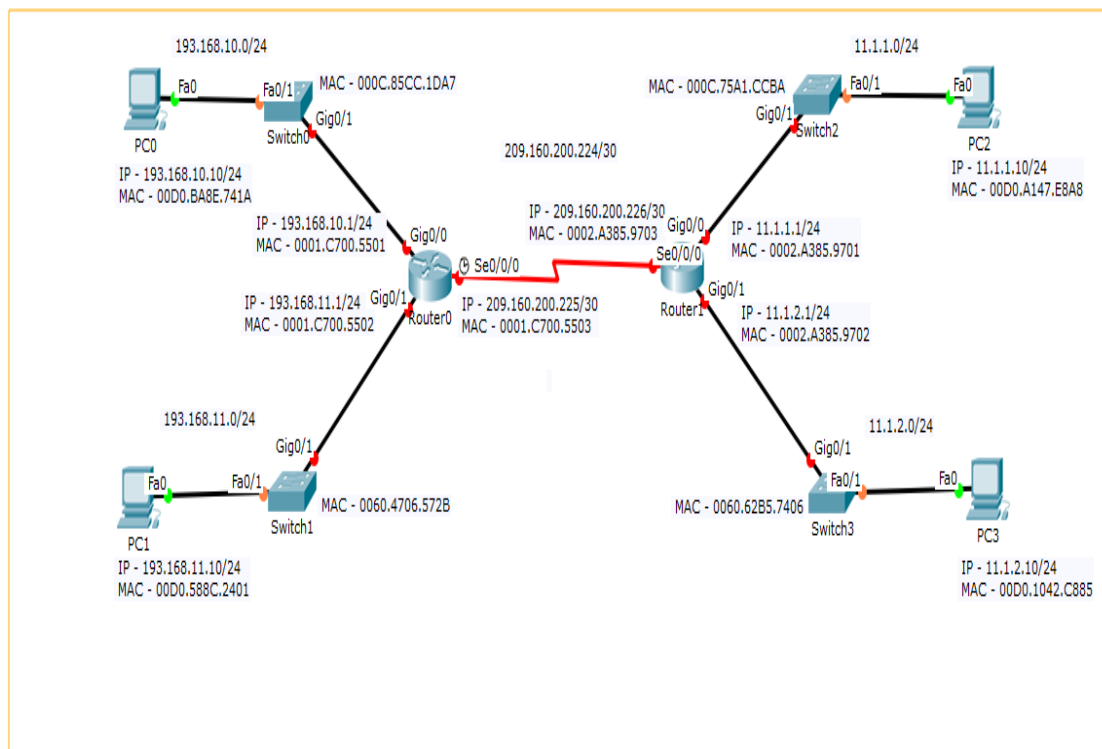Q5.   With reference to Figure 1, answer the following questions:

Figure 1: Main Campus Network

Tutorial 6: Network Layer

(i)   In Figure 1, locate directly connected routes and remote routes for Router 1.
      (201609 TAR UC, Main)   (5 marks)

	Directly Connected Routes	**Remote Routes**
Router 1		

(ii) Using the table format given below, write the Layer 2 and Layer 3 addresses when PC0 ping to PC3. Add more rows to Table 1, if necessary.
      (201609 TAR UC, Main)   (6 marks)

Step	Layer 2 source address	Layer 2 destination address	Layer 3 source address	Layer 3 destination address

Q6.   Based on the diagram shown in Figure 3, identify the remote network and next hop address for the respective network for Router 1 and Router 2. *(201509 TAR UC, Main)*   (6 marks)
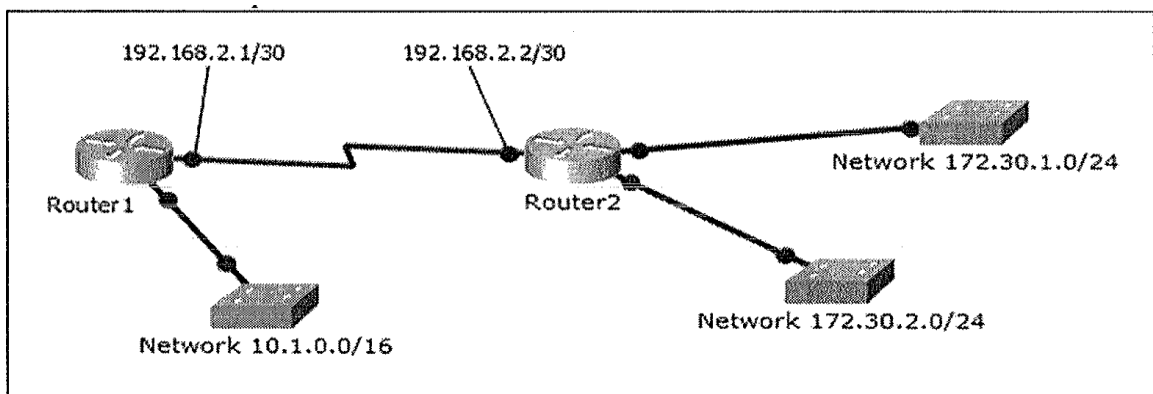

Figure 3: Network Topology Diagram

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Q7.   Differentiate between physical address and logical address. *(201509 TAR UC, Main)*   (4 marks)

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Tutorial 6: Network Layer

Q8.   Choose **ONE (1)** type of memory which can be found in a router and briefly explain **ONE (1)** function for each. *(201509 TAR UC, Main)*   (2 marks)

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Q9.   List **TWO (2)** files that a Cisco router stores in its compact flash card.   *(201503 TAR UC, resit)*
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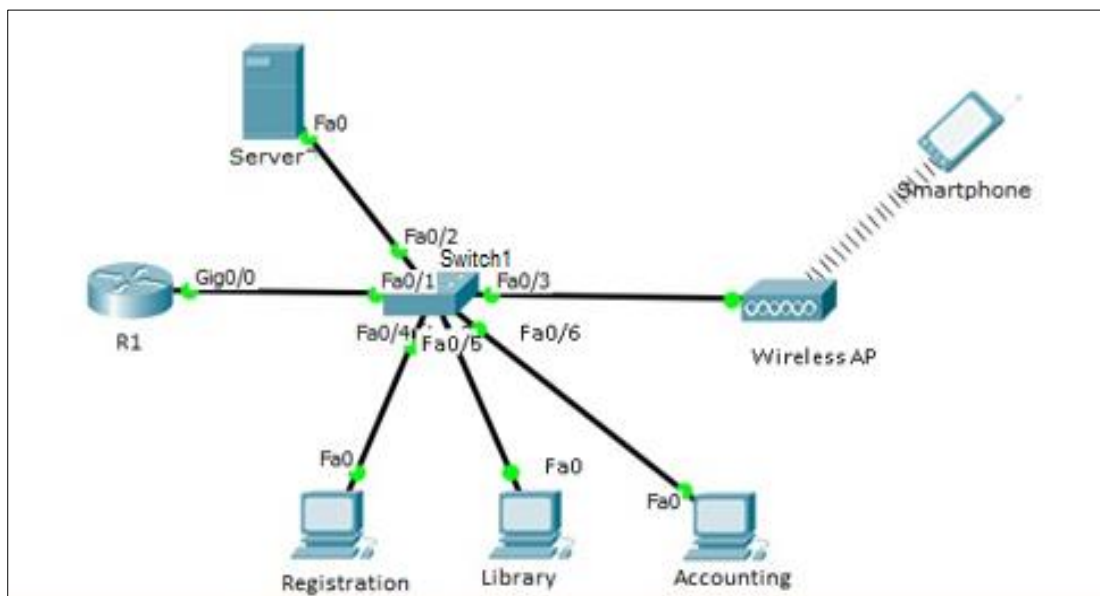Q10.   With reference to Figure 2, answer the following questions:

Figure 2: A branch network

(i)   In Figure 2, identify the default gateway for Server and Smartphone. Indicate the device name and the interface clearly in your answer. *(201605 TAR UC, resit)* (4 marks)

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(ii)

(iii) "*When Registration PC wants to send a message to Library PC, it is not required to configure default gateway in both PCs.*"
Do you agree with the above statement? Justify your answer. *(201605 TAR UC, resit)*
(7 marks)

Q11. Network Layer provides services to allow end devices to exchange data across the network.

(i) Examine **FOUR (4)** basic processes used in the network layer to accomplish end-to-end communication. (8 marks)

(ii) Describe **THREE (3)** characteristics of Internet Protocol Version 4 (IPv4). (6 marks)

    (iii)   Identify the Protocol Data Unit (PDU) of network layer.   (2 marks)

    (iv)   Give **FOUR (4)** examples of the information contained in the PDU of network layer.

    (4 marks)

Q12.   Figure 4 shows the network topology diagram of Sunrise Ltd.
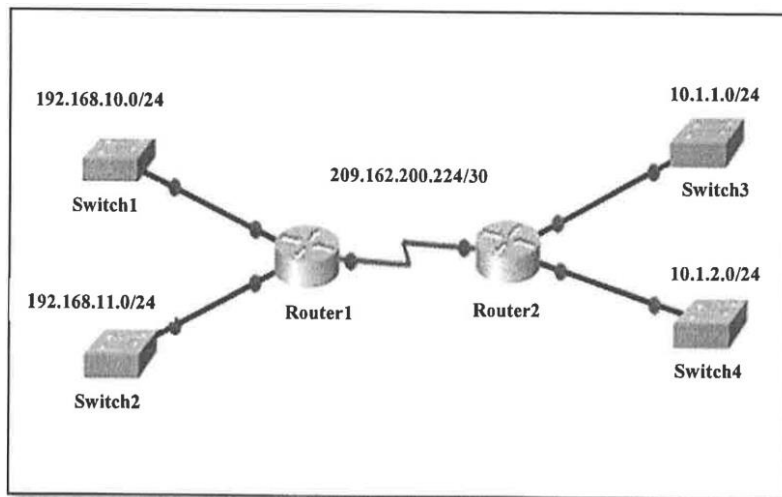

Figure 4: Network Topology Diagram

Based on the diagram shown in Figure 4, locate directly connected routes and remote routes for Router 1. (*201709 TAR UC Main*)   (5 marks)

	Directly Connected Routes	Remote Routes
Router 1		