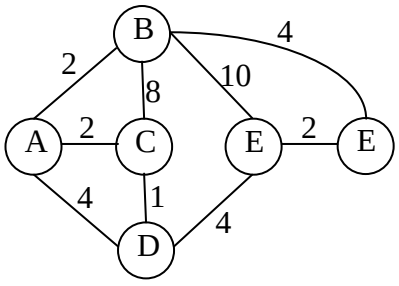
注意事項：1. 各題連寫，不留答案空地，教務處以此試題紙製版油印于試卷上，不再繕打（寫）。
2. 學生可否攜帶計算器、參考資料等，請在備註欄勾選【如未勾選，一律不准攜帶】。

考試科目	考試班級	修課人數	命題教師	考試日期	備　　註（請命題教師勾選）	
電腦網路	資工系二年級及三年級	115	王志強	100/01/14	■1. 印製命題紙 115 份（直接作答，不附答案紙） □2. 印製命題紙＿＿＿份及附答案紙 ＿＿＿份	可攜帶： □計算器 ■參考資料 □其他＿＿＿＿
學號：		姓名：				

1.Describe how *traceroute* program uses ICMP messages to identify the routers on an Internet path. (10 分)

2.Consider the network shown below. Step by step, show the operation of Dijkstra's (Link State) algorithm for computing the least cost path from **D** to all destinations. (15 分)



N'	D(A),p(A)	D(B),p(B)	D(C),p(C)	D(E),p(E)	D(F),p(F)

3. 是非題。（15 分）

	Host A is sending a large file to Host B over a TCP connection. If the sequence number for a segment of this connection is *m*, then the sequence number for the next segment must be *m+1*.
	Host A is sending a large file to Host B over a TCP connection. The number of unacknowledged bytes that A sends could exceed the size of the receive buffer.
	The size of the TCP *RcvWindow* never changes throughout the duration of the connection.
	Suppose Host A sends one segment with sequence number 38 and 4 bytes of data over a TCP connection to Host B. In this same segment the acknowledgement number must be 42.
	Consider congestion control in TCP. When the retransmission timer expires at the sender, the threshold *ssthresh* is set to one half of its previous value.

4.Suppose you have a network ID of 121.69.0.0. You need to divide it into multiple subnets with at least 500 hosts per each subnet. What subnet mask should you use so that you will be able to divide the network into maximum number of subnets? (10 分)

5. 是非題。（15 分）

	Consider sending a 3000-byte IP packet into a link that has an MTU of 500 bytes. After fragmentation, the offset of the last fragment is 360.
	128.96.34.130/33 and 128.96.34.15/33 belong to the same subnet.
	Distance-vector algorithm might encounter “count-to-infinity” problem when the link cost decreases.
	If two hosts are behind different NAT devices, there is no way to build a direct end-to-end connection between these two hosts.
	OSPF uses link-state algorithm, while RIP uses distance-vector. RIP is more scalable than OSPF.

6.是非題： Host A has an IP address of 172.16.225.93, a mask of 255.255.248.0, and a default gateway router of 172.16.224.1. Host A needs to send a packet to a new host whose IP is 172.16.231.78. Host A performs the ANDing operation on its address and subnet mask. What things will occur? (10分)

	Host A will get a result of 172.16.224.0 from the ANDing operation.
	Host A will send on to the data link a broadcast frame that contains the packet.
	Host A will broadcast an ARP request for the MAC of the host 172.16.231.78.
	Host A will change the destination IP of the packet to 172.16.224.1 and forward the packet.
	Host A will encapsulate the IP packet in a frame with a destination MAC that is the MAC address associated with 172.16.224.1.

7.(a)What is the main difference between the Aloha protocol and CSMA protocol? (5 分) (b)What is the main difference between the CSMA and CSMA/CD protocols? (5 分)

8.是非題。(15 分)

	BGP represents a path vector by an ordered sequence of AS numbers.
	BGP and OSPF both are hierarchical routing algorithms.
	BGP uses *Poison Reverse* to prevent loops in routing paths.
	Suppose *router 1* can reach *subnet X* through *border router A* and *border router B*. If *router 1* wants to send a packet to *X*, *router 1* will send the packet towards the border router that is closest to itself.
	BGP focuses on finding the least cost path to the destination.