103 網路小考二　學號：　　姓名：

1. Explain iterated query and recursive query (8%)
2. What values are used by TCP and UDP to identify their sockets? (4x6=24%)
3. Describe four operations to provide reliable data transfer over channels with errors and loss? (5x4=20%)
4. (a)Which tool allows the host running the tool to query any specified DNS server for a DNS record? (4%)

   (b) How to run the tool in (a) to execute "Please send me the host names of the authoritative DNS for ncue.edu.tw" operation? (8%)

   (c) How to run the tool in (a) to execute "Please send me the host names of www.ncue.edu.tw, but we want to the query sent to the DNS server *dns.hinet.net* rather than to the default DNS server" operation? (8%)

   (d) Which tool can be used to show your current TCP/IP information? (4%)

   (e) How to empty the DNS cache in your host? (4%) (28% total)
5. UDP and TCP uses 1's complement for their checksums. Suppose you have the following three 8-bit byptes: 00100011, 01001110, 01010100. What is the 1's complement for the sum of these 8-bit bytes? Show all work. （要寫出過程 4x3=12%）
6. Why is there a UDP? (4x2=8%)

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1. Explain iterated query and recursive query (8%)

Ans:

- iterated query: (4%)
  contacted server replies with name of server to contact
- recursive query: (4%)
  contacted server forwards the DNS query to next server and waits for the reply

2. What values are used by TCP and UDP to identify their sockets? (4x6=24%)

Ans:

- UDP socket identified by two-tuple: (dest IP address, dest port number) (4% each)
- TCP socket identified by 4-tuple: (4% each)
  source IP address
  source port number
  dest IP address
  dest port number

3. Describe four operations to provide reliable data transfer over channels with errors and loss? (5x4=20%)

Ans:

- sender adds *sequence number* to each pkt to detect duplicate pkts (5%)
- receiver uses checksum to detect bit errors (5%)
- receiver sends ACK with seq # of last pkt received OK (5%)
- sender waits "reasonable" amount of time for ACK, retransmits if no ACK received in this time (5%)

4. (a)Which tool allows the host running the tool to query any specified DNS server for a DNS record? (4%)
   (b) How to run the tool in (a) to execute "Please send me the host names of the authoritative DNS for ncue.edu.tw" operation? (8%)
   (c) How to run the tool in (a) to execute "Please send me the host names of www.ncue.edu.tw, but we want to the query sent to the DNS server *dns.hinet.net* rather than to the default DNS server" operation? (8%)
   (d) Which tool can be used to show your current TCP/IP information? (4%)
   (e) How to empty the DNS cache in your host? (4%)
   (28% total)

Ans:

(a) *nslookup* (4%)
(b) nslookup –type=NS ncue.edu.tw (8%)
(c) nslookup www.ncue.edu.tw dns.hinet.net (8%)
(d) ipconfig (4%)
(e) ipconfig /flushdns (4%)

5. UDP and TCP uses 1's complement for their checksums. Suppose you have the following three 8-bit byptes: 00100011, 01001110, 01010100. What is the 1's complement for the sum of these 8-bit bytes? Show all work. （要寫出過程 4x3=12%）

Ans:

```
    00100011
+   01001110
  ------------------------------
    01110001    (4%)

    01110001
+   01010100
  ------------------------------
    11000101    (4%)
```

One's complement = <u>00111010</u> (4%)

6. Why is there a UDP? (4x2=8%)

Ans:

- no connection establishment (which can add delay) (2%)
- simple: no connection state at sender, receiver
- small segment header
- no congestion control: UDP can blast away as fast as desired