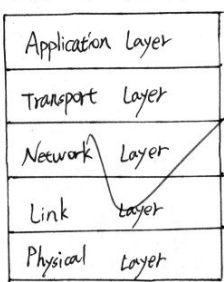


1. Give the full name of the following acronyms.

- a) P2P : Peer to Peer
- b) SMTP : Simple Mail Transfer Protocol
- c) POP : Post Office Protocol
- d) HTTP : Hyper Text Transfer Protocol
- e) ISP : Internet Service Provider
- f) DNS : Domain Name System
- g) WWW : World Wide Web

2. What are the five layers in the Internet protocol stack?



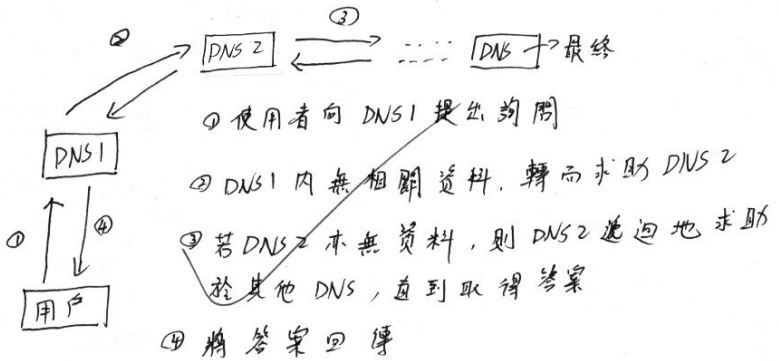
3. a) What is the Proxy cache?

代理伺服器之快取會儲存上使用者所要求之網路資源。若下一使用者要求相同資源，代理伺服器會提供快取內之資料給使用者。

b) What advantages does a proxy cache have?

使用代理伺服器之快取，可避免使用者對外要求重複資源，進而節省對外頻寬，並加速存取速度。

4. Please give a description of how recursion queries work on DNS.



5. Give the proper underlying transport protocol (TCP or UDP) for each of the following applications.

- a) Electronic mail : TCP
- b) Web : TCP
- c) DNS : UDP
- d) File transfer : TCP
- e) Internet telephony : UDP

6. What are the advantages and disadvantages over circuit switching?

- 優：
- ① 頻寬保證
- 缺：
- ① 無法分享
 - ② 易浪費資源
 - ③ 需 Call setup time

7. Please give a method for achieving load balance among three identical web servers.

- ① 設 3 server 之編號為 0, 1, 2, N 為網站第幾位訪客。
- ② 有訪客時，將之分配至 $(N \% 3)$ 號 server

DNS

how?

(背而尚有)

8.

$$T_{prop} = \frac{55 \times 10^9 (m)}{3 \times 10^8 (m/s)} = \frac{55}{3} \times 10 (s) = 183.333 \dots (s)$$

$$T_{trans} = \frac{5 \times 10^6 \times 8 (bit)}{256 \times 10^3 (bit/s)} = \frac{5}{32} \times 10^5 (s) = 15625 (s)$$

\Rightarrow 共 $15808.3 (s)$

A: $15808.3 (s)$
202.86

9.

① 允許 firewall 中之 port 20, 21

② 新增 ftp 用之帳號密碼

③ 於 IIS 中, 禁止匿名連線, 並開啟寫入, 讀取權限

10.

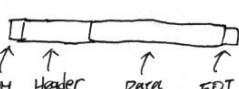
① Ring topology

② Star topology

③ Bus topology

④ Mesh topology

11. 在 1 packet 中, 需以 SOH, EOT 做為開始與結束之標記

如:  , 若封包內含 SOH, EOT 之相同字元

易造成錯誤. 因此 SOH 變成 ESC + A, EOT 則

ESC + B, 則可避免此情況

ESC \rightarrow ?

12.

$$\text{平均延遲} = \frac{\sum_{i=0}^{N-1} \frac{i \cdot L}{R}}{N} = \frac{0 + \frac{L}{R} + \frac{2L}{R} + \dots + \frac{(N-1)L}{R}}{N} = \frac{\frac{L}{R} (0 + \dots + (N-1))}{N}$$

$$= \frac{\frac{L}{R} \times \frac{(N-1)N}{2}}{N} = \frac{L(N-1)}{2R}$$

A: $\frac{L(N-1)}{2R} (s)$