# Homework 1 Structure of the Internet Answers

1. A large multinational corporation is setting up new head offices in China for which it requires a block of 1,000 IP addresses.   
     
   It wants its own direct connections to the Internet without involving an ISP, so instead contacts the appropriate Regional Internet Registry.  
   1. Define the following terms: [3]
      * ISP – Internet Service Provider is a company that connects its customers to the Internet
      * IP address – Unique combination of numbers used to identify a device on a network (at network rather than hardware level)
      * Internet Registry – Organisation that controls the allocation of IP addresses within a certain region
   2. The Local Registry cannot provide enough addresses as there are not enough available. Explain why this might be the case. [2]1 mark for each point:
      * IP addresses are limited in number (to only a few billion)
      * All available IP addresses in the region may have already been allocated
2. Web pages are accessible by typing a URL into the address bar of a web browser, for example <http://theimportanceofhomework.co.uk/hourseverynight.html>
   1. Using the example, explain what the components of a URL are. [3]  
      1 mark for each point:
      * http:// is the protocol used to download the resource
      * theimportanceofhomework.co.uk is the domain name – name used to relate to IP address of where resource server is found
      * hourseverynight.html is the resource – item to be downloaded
   2. State the Top Level Domain (TLD) for this address. [1]

1 mark for:

* + - .uk
  1. URLs rely on DNS. Explain how this system is used to determine the destination IP addresses of the required resource. [3]

1 mark for each point:

* + - Domain names used instead of IP address to reference a resource on a network
    - Local DNS server contacted for IP address;
    - If it cannot supply one, it sends a request to another authoritative DNS server.
    - This is repeated across inceasingly authorotative servers until an address is found; or not, when a suitable ‘could not be located’ message would be returned.
    - A DNS server somewhere has authority over a specific domain name and records the assigned IP address to send to the device making the request
  1. Traditionally top-level domains were based on countries. As the Internet has expanded there have been several more top-level domains added.   
       
     How do local DNS servers know when new top-level domains are added? [4]  
     1 mark for each point:
     + DNS names are hierarchical starting with the root servers
     + These root servers know the location of all top-level domains
     + As top level domains are added the root servers are updated
     + If the local DNS server has no stored record of the new domain, it contacts a root server, so can be informed directly about any domain name in existence
     + A local DNS server would not know a domain had been added until a client performs a lookup of the associated domain name
  2. Describe how the Internet and the World Wide Web are different [4]

1 mark for each point (4 max):

* + - Internet is the connections between computers / smaller networks
    - Internet uses TCP/IP communications protocols
    - The WWW is a system of hyperlinked documents
    - WWW is accessed using the Internet
    - WWW uses the HTTP protocol to transfer these documents

[Total 20 Marks]