T01: Introduction To Networking

Q1: Fill in the table to indicate the layers that handle each of the following functions:

Function	OSI Model Layer ?	TCP/IP Model Layer ?
Dividing the transmitted bit stream into frames		
Determining which route to use through the subnet (LAN)		
Determining which route to use through the internet		
Determining which application to communicate with in a remote host		

Q2: Consider the following case studies:

a. The French and Chinese Prime Ministers need to come to an agreement by telephone, but neither speaks the other language. Further, neither has on hand a translator that can translate to the language of the other. However, both prime ministers have English translators on their staffs. Draw a diagram (similar to a protocol stack) to depict the situation and describe the interaction at each level.

b. Now suppose that the Chinese Prime Minister's translator can translate only into Japanese and the French Prime Minister has a German translator available. A translator between German and Japanese is available in Germany. Draw a new diagram that reflects this arrangement and describe the hypothetical phone conversation.

Q3: A man gets onto a Qantas flight to Sydney with 100 CDs full of data, each CD can store 650MBytes of data each. The plane travels to Sydney in 4.5 hours. Calculate the bandwidth (in bits per second) this communication medium can offer.

Q4: Given the following parameters for a switching network:

N = number of hops between two given end systems

L = message length in bits

B = Data rate in bits per sec (bps) on all links

P = fixed packet size

H = overhead (header) in bits pet packet

S = call setup time (circuit switching or virtual circuit) in seconds

D = propagation delay per hop in seconds

Compute the end-to-end delay for

(i) **Circuit Switching**,

(ii) **Packet Switching** and

(iii) Virtual Circuit Packet Switching.

Assume that there are no acknowledgements and ignore processing delay at the nodes.

Q5: Compare and contrast Circuit Switching, Packet Switching and Virtual Circuit Packet Switching networks while providing example for each of the networks?