T07: Transport Layer I

Q1: Explain the difference between end-to-end communication and node-node communication with a diagram. What does transport layer facilitate (end-to-end communication or node-node communication)?

Q2: What are the similarities and dissimilarities in transport and data link layer protocols? Is flow control & buffering in transport layer different from data link layer? Briefly explain.

Q3: Both UDP and TCP use port number to identify the destination entity when delivering a message. Give two reasons for why these protocols invented a new abstract ID (port number), instead of using process IDs, which already existed when these protocols were designed?

Q4: Why does the maximum packet lifetime, T, have to be large enough to ensure that not only the packet but also its acknowledgements have vanished?

Q5: Why does the symmetric connection release is not completely foolproof? Explain with a diagram.

Q6: How does transport layer recover from a router or network crash? Explain your answer with respect to unreliable datagram service (packet switching), connection-oriented network service (virtual-circuit packet switching).

Q7: When hosts/servers crash, recovery becomes an issue. There are always situations where the protocol fails to recover properly.

For the strategies (sending host and receiving host) shown in the table below, indicate whether it's **OK**, **DUP** (packet duplicate), **LOST** (packet loss) appropriately.

Assume each client (sender) can be in one of the two states (S0, S1) when the Sever (receiver) announces that it had just rebooted and request that its clients (senders) to inform the status of all open connections.

- No TPDUs outstanding, S0
- One TPDU outstanding, S1

Hint: first one is done for your reference

Strategy used by Client	**Strategy used by Server**					
	First ACK, then write			**First write, then ACK**		
	AC(W)	AWC	C(AW)	C(WA)	WAC	WC(A)
Always retransmit the last TPDU	OK	DUP	OK	OK	DUP	DUP
Never retransmit the last TPDU						

Retransmit only in state S0 (No TPDU outstanding)						
Retransmit only in state S1 (TPDU outstanding)						