

## Topic 1: Networks

### Questionnaire 1 – The Network Core: Circuit Switching and Packet Switching

**Q1.** A path is the sequence of communication links and switches to transmit data from the sending end system to the receiving end system. In packet-switched networks:

- A. data is transmitted along the path in data units (chunks of data) known as packets, and the delivery of all packets are guaranteed.
- B. packets are transmitted at full link bandwidth over each communication link along the path.
- C. a constant transmission rate is reserved for each communication link (i.e., a fraction of each link's transmission capacity) along the path.
- D. resources along a path are previously reserved and statically allocated for the transmission of the data.

**Q2.** Store-and-forward transmission:

- A. is used in circuit-switched networks.
- B. is a technique in which a packet switch (e.g., router) receives all the packet's bits before it can begin to transmit the first bit of the packet onto the outbound link.
- C. implies that it takes  $L/R$  to transmit one packet from source to destination considering a simple network consisting of two end systems connected by a single router and ignoring propagation delay.
- D. implies that it takes  $N(L/R)$  to transmit one packet from source to destination over a path with  $N$  routers, ignoring propagation delay.

**Q3.** In packet-switched networks, a packet:

- A. may suffer output queuing delay.
- B. never suffers store-and-forward delay.
- C. always suffers store-and-forward delay and output queuing delay.
- D. may be lost if the arrival of a packet to be transmitted onto a link occurs when the link's output buffer is completely full.

**Q4.** In circuit-switched networks, a circuit in a link is implemented with either FDM or TDM.  
With TDM:

- A. each circuit receives a fraction of the bandwidth periodically during time slots.
- B. each circuit continuously receives a fraction of the bandwidth.
- C. time is divided into slots of fixed duration, and each slot is divided into a fixed number of frames.
- D. the transmission rate of a circuit is equal to the frame rate multiplied by the number of bits in a slot.

**Q5.** With circuit switching:

- A. more users can use the network.
- B. queuing delays can occur.
- C. end-to-end circuits are established but end-to-end transfer of data at a constant rate is not assured.
- D. inefficiency occur when a dedicated circuit is idle (pre-allocated network resources to the connection are not being used).