Before you start your assignment you ***must*** read the following instructions.

1. Your answers should be ***precise*** and ***to the point*** as it is not based on a fiction novel, it is something ***technical***.
2. Write your name and roll number.
3. Use standard A4 size paper to solve the questions and write legibly. Otherwise your assignment will remain ungraded.
4. Please do not copy !

Question 1:

Calculate the latency (from first bit sent to last bit received) for the following:

(a) 100-Mbps Ethernet with a single store-and-forward switch in the path and a packet size of 12,000 bits. Assume that each link introduces a propagation delay of 10 μs and that the switch begins retransmitting immediately after it has finished receiving the packet.
(b) Same as (a) but with three switches.
(c) Same as (a), but assume the switch implements “cut- through” switching; it is able to begin retransmitting the packet after the first 200 bits have been received.

Question 2:

Suppose a 1-Gbps point-to-point link is being set up between the Earth and a new lunar colony. The distance from the moon to the Earth is approximately 385,000 km, and data travels over the link at the speed of light—3×10^8 m/s.

(a) Calculate the minimum RTT for the link.
(b) Using the RTT as the delay, calculate the delay × bandwidth product for the link.
(c) What is the significance of the delay × bandwidth product computed in (b)?
(d) A camera on the lunar base takes pictures of the Earth and saves them in digital format to disk. Suppose Mission Control on Earth wishes to download the most current image, which is 25 MB. What is the minimum amount of time that will elapse between when the request for the data goes out and the transfer is finished?