Q2) Argue the need for a new application layer protocol for this network application instead of using existing standard protocols (e.g. HTTP, SMTP, WebSocket, etc.) [10 points]

The need of a new application layer protocol stems from the requirements given, or what is needed for a user. As there are many application protocols, why there is a need to implement a new one; this is due to limitations with current application protocols. For example, if we prioritize security in this application with this new protocol, then HTTP and SMTP are not ideal because in HTTP, if a message is intercepted, then the hacker can view all the content (which may include confidential information), and may alter the content as well since HTTP messages are no encrypted; SMTP is insecure as well, can be easily hacked, so hackers can send fake emails with any address. If a requirement of needing to send multiple content in a single request is needed, then HTTP would not be suitable since HTTP is only able to send one content at a time, for example if 5 images are needed for a webpage, then there has to be 5 different request for each image. If there is need a for recovery for when connections are terminated, or compatibility with older browsers, then Websockets may be not be a suitable choice. Designing and implementing a new application ultimately comes down to other application protocols not meeting requirements of a user’s requirement, as well as current limitations with current application protocols