# CSE320: Data Communication
# Assignment - 1
# Total Marks: 15
# Total Questions: 8

**Q1.** *Identify different layers of the OSI model from the following analogy*

Student: Hello Sir, Can I come for a consultation?
Teacher: Yes, I will be at my office from 9.30-12.30. Please come within the time frame.
Studnet: Okay, I'll meet then. **(1) . . . . . .**

**At Consultation**

Teacher: I actually teach 2 courses, CSE320 & CSE220, for which course do you have confusions?
Student: CSE220, Data Structure.
Teacher: OK, let's discuss it. **(2) . . . . . .**

Student: Sir I can understand Lab task 4 but can not convert it to code properly, can you help me writing the code?
Teacher: Let's write a python program. **(3) . . . . . .**

Student: Thank you sir.
Teacher: Actually you can break the problem into 3 parts. Create an array first, then store the unique hobbies to it. Finally count the frequency of each hobby. **(4) . . . . . .**

Students: Wow, the task looks easy now. I will write the code myself and send it to you using slack for reviewing.
Teacher: Great. See you next class. **(5) . . . . . .**

**Q2.** What is the difference between Reliability and Security? Can communication be secured but less reliable?

**Q3.** For n devices in a network, what is the number of cable links required for a mesh, ring, bus, and star topology ? Show the calculation.

Q3.1 If we use simplex communication mode
Q3.2 If we use full-duplex communication mode

**Q4:** UNICODE data representation can represent texts such as symbols, letters, digits. Why do we still use ASCII code in some cases for data representation?

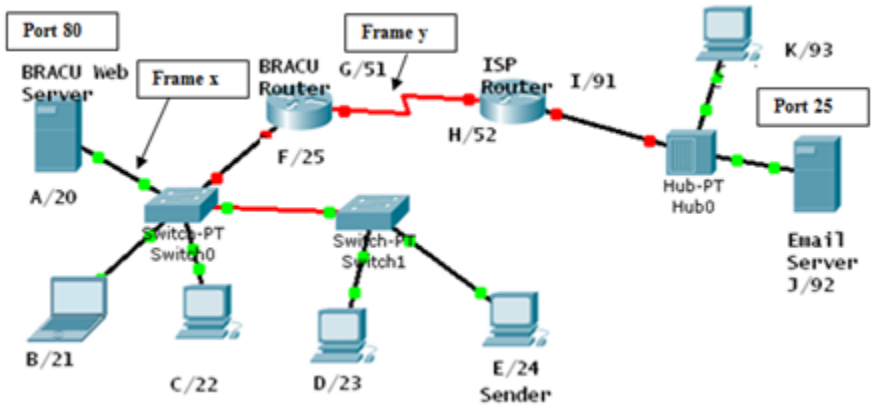
**Q5:** Match the following to one or more layers of the TCP/IP protocol suite:

A. Encryption and Decryption
B. Cookies management
C. Data fragmentation and reassembly
D. Data translation
E. Hop to hop communication
F. Route Discovery

**Q6:** *Suppose we want to design a network system for BRACU. There are 5 main academic buildings which need to be connected in such a way that the network is never down. 4 labs are connected with each academic building using hubs. There are 30 computers in each lab. The computers in a lab are connected in such a way that the cabling-cost is minimized but no single point of failure. Now as a CSE engineer, design a hybrid topology that fulfills all the requirements. Calculate the total links required for the network systems. Calculate total cost using the table below:*

| Topology | Cost Per Link (tk) |
|---|---|
| Mesh | 25 |
| Star | 100 |
| Bus | 70 |
| Ring | 60 |

**Q7:** Complete the frames (x & y) given below with appropriate port, IP and MAC addresses. The sender Host E has two applications running; one for email with port number 49254 and the other for accessing the web server with port number 52167. The frame x is intended for the BRACU Web server and frame y is coming from the Email Server. (MAC addresses are alphabets and IP addresses are numbers)




Frame X

| D. Mac | S. MAC | D. IP | S. IP | D. Port | S. Port |
|---|---|---|---|---|---|

Frame Y

| D. Mac | S. MAC | D. IP | S. IP | D. Port | S. Port |
|---|---|---|---|---|---|

**Q8:** What are fundamental characteristics that define the effectiveness of a network communication?

**********END**********