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|  | **BAHRIA UNIVERSITY,**  **(Karachi Campus)**  *Department of Software Engineering*  **ASSIGNMENT#01 – Fall 2023** |

COURSE TITLE: **Computer Communication & Networks** COURSE CODE: **CEN-223**

Class: **BSE - 5** Shift: **Morning**

Course Instructor: **Dr. Muhammad Hussain** Date: **Sep 27, 2023**

Due Date: **Oct 08, 2023** Marks: **5.0 Marks**

**Instructions:**

1. **Attempt all three questions.**
2. **Question#3 is a “Complex Engineering Problem (CEP)” having an attributed of no obvious solution.**
3. **This is an individual effort task.**
4. **Only handwritten answers are accepted.**
5. **Write your full name, registration number and section on the title page.**

Q1. Describe the following terminologies: **[CLO#1, 1.0 mark]**

1. Internet.
2. Protocols.
3. Internal reflection in fiber optics.
4. Line-of-Sight in communication.

Q2. As a Software Engineering, explain how the TCP/IP layered architecture can help in your future design and development of different kinds of *software (such as Web-Applications, Mobile Applications, Telecom Software, Operating Systems, etc.)*. **[CLO#2, 2.0 mark]**

Q3. Design a suitable and resource efficient network topology for an inter-network having the following specifications: **[CLO#5, CEP, 2.0 marks]**

* Three different routers are in use, with each router being connected to a different LAN, i.e. LAN#01, LAN#02 and LAN#03.
* The different LANs host 30, 40 and 50 desktop computers for LAN#01, LAN#02 and LAN#03, respectively.
* Switches are used within each LAN, where each switch is of 24 ports only.
* Within each LAN, switches are connected in the form of a hierarchy and ports of the parent switch must be filled first before filling the child switch(s), if needed.
* Communication between the three routers should provide the highest amount of reliability and robustness between the networks.

**Good Luck!**