[Any examinee found adopting unfair means will be expelled from the trimester/program as per UIU disciplinary rules.]

There are **4 (Four)** questions. Answer **all 4 (Four)** questions.

Q.1 a) What is HTTP? Describe the two types of HTTP connections.   **[4]**

b) For FTP, what do you mean by "*separate control, data connections*"? Explain with a diagram.   **[3]**

c) Can an authoritative DNS server be a Local DNS server? Provide your rationale, why or why not.   **[3]**

Q.2 a) With a neat and clean diagram, show a sample *premature timeout/delayed ACK* scenario for **rdt 3.0**.   **[4]**

b) Explain with diagram, *multiplexing* at the transport layer of OSI reference model.   **[3]**

c) Which of the pipelined protocols is better: GBN or SR? Why? Justify your answer.   **[3]**

Q.3 a) Consider the diagram in **Fig. 1** to answer the questions: **[1+3=4]**

    (i) What type of diagram is this?

    (ii) Which **rdt** does it depict? What are the assumptions for such **rdt** mechanism? Describe your understanding of the diagram.
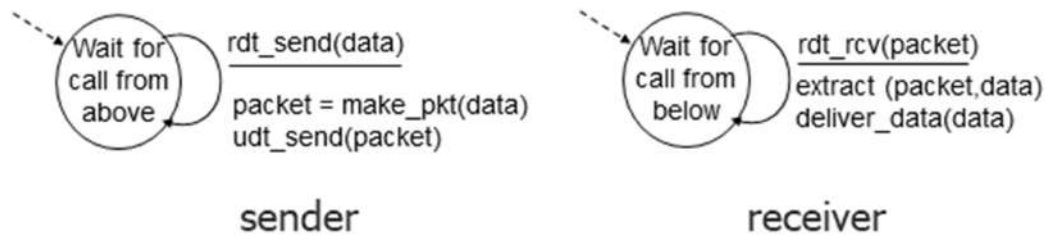

Fig. 1.

b) Explain the concepts of **Data Plane** and **Control Plane** for Network Layer of OSI reference model.   **[3]**

c) What is the key difference between **link state** routing algorithm and **distance vector** routing algorithm?   **[3]**

Q.4 a) A datagram of **6000 bytes** arrives at a router that should be forwarded to a link with an **MTU of 1,820 bytes**. Suppose the original datagram is stamped with **an identification number of 666**. Assume that the size of the **IP header is 20 bytes**. With a diagram, show different fragments including the *length*, *ID*, *fragflag* and *offset* values.   **[4]**

b) Given a network diagram (**Fig. 2**) as a graph $G = (N, E)$, where N is the set of routers and E is the set of links, use **Dijkstra's link-state routing algorithm** to compute the least cost path from **node 0** to all other nodes.

    Also, show the resulting **least-cost-path tree** from **0**. Show all calculations to get full credit.   **[5 + 1 = 6]**
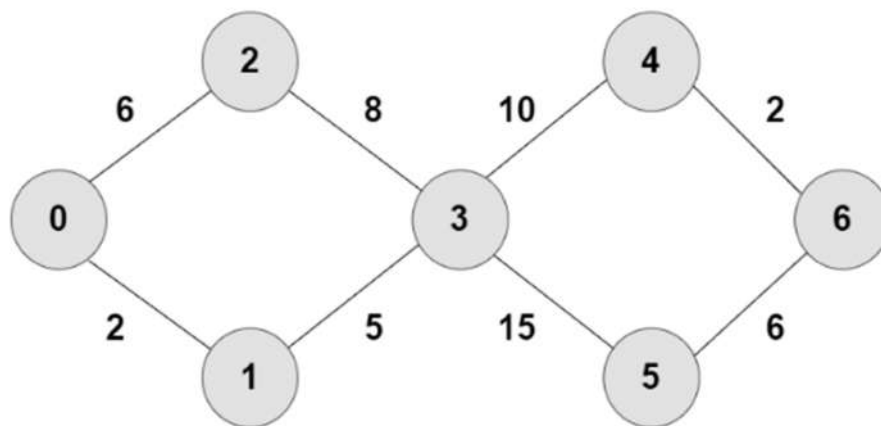

Fig. 2.

←**End of Paper – Thank You**→