Parallel and Distributed Computing (6E / 6F) Quiz 06 (Spring 2022). Instructor: Dr. Syed M. Irteza		Name: **SOLUTION**
Date: 2022-06-01		Roll Number:
Total Marks: 15	Time Allowed: 10 mins	

1. If I know the size of the message (e.g., 10 Megabits), and I know the number of hops (e.g., 5), as well as the startup time at the source (e.g., 100msec), what other pieces of information do I need to know for calculating the total time taken for data transfer of this message? Please write an expression for this as well (using the information given above). [6m]

    We know m (10Mb), we know n (5), and we also know t_s (0.1sec).

    We need to know:
    t_w (bandwidth)
    t_h (Arrival latency, or propagation delay)
    t_r (receiver handling time)

    $t = t_s + (t_w*m + t_h + t_r)*n$
    $t = 0.1 + (t_w*10*10^6 + t_h + t_r) * 5$
    (We will expect the value t_w in terms of bits per second, bps)

2. What was the use case for grid computing that made it unique from other forms of distributed computing? [2m]

    Solution of Scientific Problems (refer to slide 18, Lecture 23)

3. Can we say that middleware is an alternative for a network OS? [4m]

    No. Middleware normally works on top of network OS services, thus they are not alternatives for each other (refer to slides 24-25, Lecture 24).

4. What kind of application would suit a peer-to-peer architecture? [3m]

    Where centralized servers would make the application response time very high.

    Appropriate for applications like:
    Instant messaging,
    Peer-to-peer file transfers,
    Video conferencing, and
    Collaborative work